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THE HERTER LECTURES.

LECTURE II.—THE CONTRIBUTIONS OF PHARMACOLOGY TO PHYSIOLOGY.[1]

By Hans Meyer,

Professor of Pharmacology in the University of Vienna.

Ladies and Gentlemen:

In my first lecture I touched upon a series of physiological problems that have been elucidated in a pharmacological way. I treated these problems in a merely cursory manner and did not enter upon details of the various investigations. Permit me to-day to discuss more fully a problem which has for a long time claimed my attention and which has for many years been a topic of research in my laboratory, namely, the problem of renal function.

As is well known, there are two leading and opposing theories on the nature of urinary secretion. According to one of these theories, which was developed most fully by Heidenhain, we have to deal with a true secretory process by which water and perhaps the salts pass through the glomerulus, whereas the specific constituents of the urine are liberated from the tubules so that the sum of both secretions is represented by the outflowing urine. According to the other hypothesis, which was first proposed by Ludwig and subsequently modified by his successors (in a biological sense), there goes on in the kidney side by side with the glomerular activity, dependent essentially on the mechanical conditions of the circulation, and independently also on the secretion of certain urinary constituents, a process of resorption in the urinary tubules. Through this resorption the slightly concentrated secretion of the glomerulus, corresponding to the water of the blood, undergoes concentration to a point characteristic of the urine.

The output of urine is chiefly conditioned on the largely physical excretory process, which, on account of its dependence on the blood flow, and the blood pressure in the kidneys, one is justified in regarding as a kind of filtration or transuda-

[1] Delivered at the Johns Hopkins Medical School, October 5, 1905.

tion. On the other hand, the resorption of water through the tubules is not directly dependent on the circulation of the blood. That is, it is in nowise proportional to the abundance of the glomerular filtration. It would be more nearly correct to say that this process is inversely proportional to the filtration. There is, therefore, the more abundant and unconcentrated urine when the blood flow is more abundant, and, on the contrary, a more scanty and concentrated urine when the blood flow is scanty.

The Ludwig theory, as you are aware, is based chiefly on the directly evident dependence of the urinary secretion on the blood stream through the kidneys and on the blood pressure, and in fact this connection is a striking one. I will remind you of the experiments of Goll which were conducted as long ago as the year 1854, in which the tension of the vessels was lowered by vagus irritation or by bleeding, or elevated by clamping the large vessels of the extremities, in which the volume of the urine rose and fell according to the increased or diminished flow of blood through the kidneys.

Against the whole theory of Ludwig, supported as it was by many other facts and arguments, Heidenhain brought a series of objections of which the following was especially impressive. If the human blood holds about one-tenth of one per cent of urea and if it be estimated that the daily excretion averages about 30 grams of urea, it would follow that on the smallest estimate 30 liters of fluid must filter through the kidneys in twenty-four hours, for which about 28 liters of water must be reabsorbed. But if, according to the calculation of Heidenhain, not more than 230 liters of blood pass through the kidneys in the course of a day, it follows that, according to Ludwig's view, about one-quarter of this volume filters out—a condition which would lead to a wholly impossible concentration of the blood in the glomerulus. In addition to this objection was urged the uneconomical work involved in the resorption through the urinary tubules of such great quantities of superfluous water. But we now know through the careful investigations of Tigerstedt that there flows through the kidneys during a very moderate diuresis in one minute a quantity of blood corresponding to 80 to 100 per cent of their weight, or, in other words, since the human kidneys weigh about 300 grams these organs are traversed by about 240 to 300 grams of blood in a minute, equivalent to 345 to 430 liters in twenty-four hours. Thus it is only about one-twelfth to one-fourteenth of the volume of blood, and not one-fourth of its volume, that is expressed. And so far as the chemical work of resorption is concerned, it must be remembered that the work of excreting 30 grams of urea through the elective action of the tubular epithelium from blood holding only 0.1 per cent of urea must be exactly as great as the corresponding work of resorption by the same cells—in order to concentrate a 0.1 per cent blood filtrate to 1.5 per cent of urea through the resorption of water. Now Heidenhain endeavored to demonstrate the specific secretory function of the epithelia by means of injection of coloring matters. He injected into the veins of a rabbit a definite quantity of sodium sulphindigotate and removed the kidneys after a certain period of time, injected the vessels with alcohol and examined the structures histologically. He then found under certain conditions that the glomeruli were wholly free from coloring matter; the epithelia of the tubules, on the other hand, were colored. And he concludes from this that the dye was not secreted from the glomerulus but was secreted by the tubules. And from these observations Heidenhain made the inference that the epithelia of the tubules secrete also other constituents of the urine.

These experiments are so well known that I do not need to enter more fully upon them; what concerns us here is that they secured a wide acceptance for the Heidenhain theory. But since the pharmacological study of glandular secretion as compared with renal activity has shown that these forms of cellular function are different and even opposed to one another in certain respects, and since the behavior of certain pharmacological agents is difficult to harmonize with the Heidenhain view and easier to bring into accord with the theory of Ludwig, a number of pharmacological studies have been undertaken with a view to testing the validity of the Ludwig theory. If, as Heidenhain maintained, the coloration of the kidney is an indication and measure of its normal secretory activity, it might be expected that by means of experimentally increased diuresis this coloration would show corresponding alterations, that is to say coloration would be intensified in the tubules. With this idea in mind Sobieranski, about ten years ago, began a new study of this subject in my laboratory by means of color injections carried out according to the Heidenhain method. His results on normal animals led him to the conclusion that dyes were not excreted by the convoluted tubules, as Heidenhain thought from his findings, but in company with the water stream through the glomeruli, whence the dye passed into the tubules and was absorbed into the epithelium, coloring their nuclei. Through the simultaneous reabsorption of water by the tubules, the dye-stuff solution becomes more and more concentrated so that it (the dye) under certain conditions is bound to be separated in a crystalline state in the epithelium.

This had already been shown to be the case by experiments with sodium sulphindigotate, but still more clearly by means of experiments with carmine, a dye which is better adapted to this kind of experimentation because it does not undergo reduction (with loss of color) in the tissues. Even more surprising and striking were the results obtained on diuresis under the influence of caffeine, sodium nitrate, or urea. Here the tubules were found to be very little or not at all colored. It was thus shown that an increase in the secretion of the dye through the tubular epithelium, which the hypothesis of Heidenhain calls for, under these circumstances did not exist. On the other hand, the process becomes intelligible through the explanation of Sobieranski. These diuretics give rise to diuresis by inhibiting the absorption of water from the urinary tubules, and at the same time prevent the absorption of the coloring matter by the tubular structures. Against this interpretation of Sobieranski's findings it is possible to offer

certain objections, the validity of which we have recognized from the beginning. The experiments of Sobieranski can be regarded as corroborative evidence of the resorption function of the urinary tubules, but not as positive proof of this function.

One may approach the subject, also, from an entirely different side. If the process of separating water from the blood in the glomeruli is not an elective secretory process, as in other glands, but is in reality a process analogous to filtration, that is to say is essentially dependent on physico-chemical conditions, then one would expect, as Tamman has already shown, that together with the free water of the blood (not held by the blood colloids) the dissolved crystalloid constituents, like urea and salts, would simultaneously filter through; in other words, that with increased separation of water these bodies would also be excreted in increased amounts. On the other hand, the colloids and other substances similarly held in the blood, which cannot transude or filter through the normal glomeruli, are not driven through with the water flow. They must rather be secreted through specific cell activity and quite independently of all mechanical filtration.

Indeed we have known for a long time from purely clinical observations that some urinary constituents, like urea and sodium chloride, are excreted almost proportionately to the volume of the urine; and that others, on the contrary, like uric acid and phosphoric acid, are not influenced by the quantity of urine. In order to examine this problem in a quantitative way, a series of observations have been made by my assistant and collaborator, Otto Loewi. These experiments were made on dogs and rabbits in the following manner: The normal excretion of uric acid, urea, and phosphoric acid was studied during a preliminary period of several hours. In still other cases the excretion of sugar was studied—indeed, not merely in diabetes following pancreas extirpation, but also after phlorhizin administration and intravenous injections of sugar. Then the secretion of urine was increased experimentally through free administration of water or by means of diuretics, such as sodium nitrate or caffeine, and during the diuresis so induced the above-mentioned constituents were quantitatively determined. Finally similar observations were made during and after the period following the cessation of the diuresis. The outcome was that the excretion of urea and of chlorides ran regularly parallel with the volume of the urine. On the other hand, there was never observed any parallelism between the excretion of water, on the one hand, and the increased amount of uric acid and phosphoric acid normally produced in the organism, on the other. I specially emphasize the phosphoric acid normally produced in the organism, for any phosphoric acid introduced as a salt into the circulation showed a different behavior. Such introduced salts followed the same law of excretion as the chloride and urea; and this general law held true in the case of sugar.

The blood, as is well known, always contains sugar, but in a combined form, so that the sugar under normal conditions is not excreted by the kidneys. But after pancreas extirpation or after an intravenous infusion of sugar in normal animals, the sugar content of the blood rises above the normal; the greater part of it cannot exist in combination in the blood but is free, and, like urea and other crystalloids, is excreted by the urine. And it appears from Loewi's experiments on diuresis that in such pancreatic or infusion diabetes, the quantity of excreted sugar was always proportional to the volume of urine excreted. In phlorhizin diabetes, on the other hand, the behavior was entirely different. As you are aware, there occurs no hyperglycæmia in phlorhizin glycosuria. There is no increase of free sugar in the blood, but the normally combined sugar is liberated from its combination and excreted from the kidneys. And this specific cellular sugar excretion was shown to be quite independent of the filtration of fluid through the glomeruli, that is, independent of the amount of diuresis. From this it seems to follow, in fact, that the substances which exist free in the blood pass out mechanically with the water; while other bodies, such as uric acid, phosphoric acid, phlorhizin-sugar, and probably the urinary pigments, are excreted from the kidney by special secretory activity. It is not necessary that a substance exist in a crystalline state in order that it be secreted by mechanical filtration through the glomeruli; it may equally well be a colloid; provided, however, that it is not combined with the blood tissue. It has long been known that dissolved hæmoglobin and injected albumin passed through the kidney into the urine. It is also shown by direct microscopical investigation that these bodies pass through the glomeruli. And, as in the case of urea and salts, this excretion of proteids through the glomeruli has been shown by experiments by Dr. Schmidt and Dr. Loewi in my laboratory to be a mechanical filtration.

This specific excretion of uric acid, etc., cannot be increased by any of the known diuretics. The action of diuretics, therefore, can surely not be explained by the supposition that there is a stimulation of the secretory activity of the kidneys. And, moreover, a specific renal secretion is something quite different from the secretory activity of the glands, for the typical glandular poisons, like pilocarpine, not merely are without influence on diuresis in general, but have no effect whatever on the specific excretion of uric acid, phosphoric acid, etc. If, then, the filtration of the watery constituents of the blood is highly probable, it follows that as a means of saving water there must be a compensatory resorption in the tubules analogous to the process of resorption from the alimentary canal. In the case of the intestinal tract large quantities of fluid are secreted from the mouth, stomach, and small intestines, even to the amount of several liters in twenty-four hours, which is later reabsorbed in the large intestine, especially in the colon, resulting in the semi-solid fæces. And a similar process may be conceived to go on in the kidneys.

We have undertaken to determine whether this conception is correct. If under normal conditions such a process of concentration occurs in the tubules, one would expect a diarrhœa (that is, a flow of unconcentrated fluid from the blood)

to result from elimination of or injury to these parts; just as there results a flow of watery fæces if the colon be removed or its cells paralyzed by poisons, or if the contents of the intestines are rendered incapable of absorption by the addition of certain salts. With this thought in mind, Ribbert long ago conducted experiments involving the removing of the medulla of the kidney, as a result of which he did, in fact, observe an increased secretion of a very dilute urine in rabbits. Similar experiments were undertaken by Dr. Hausmann and myself three years ago, by means of a somewhat modified operative technique and especially with the aid of quantitative analysis of the urine. In rabbits from which the right kidney had been removed previous to operation on the left kidney, we found the excretion of urine increased three or four times, just as did Ribbert, and observed a change from a concentrated mucous-like urine before the operation to a light-colored watery urine of low specific gravity after the operation. Quantitative analysis further gave the noteworthy result that whatever might be the normal content of chlorides and urea, after the operation, the content always approximated that of the blood serum; for example, if the normal content of the sodium chloride in a diet poor in this salt averaged 0.1 per cent, or in a diet rich in sodium chloride approximated 2 to 5 per cent, after the operation there would result in each case a percentage of sodium chloride which varied within the narrow limits of 0.6 to 0.8 per cent. This result seemed to speak strongly for the resorption theory. The resorption activity of the kidney may be influenced by pharmacological means as well as by removal of the uriniferous tubules. One would expect, as in the case of the intestines, that salts would check resorption from the tubules, and, further, that as in the case of the intestines, the bibasic would act more strongly than the monobasic salts. Comparative study of the action of Glauber salt and common salt injected into the blood vessels, made by Dr. Halsey, yielded the expected results. Results similar to these unpublished ones have been obtained by Gottlieb and Magnus, of Heidelberg, and especially by Cushny, of Ann Arbor. The isosmotic solution of Glauber salts possessed a much more strongly diuretic action than common salt. From these experiments we may conclude with Cushny that the salts prevent water resorption from the tubules and set up a kind of diarrhœa in proportion to their power of withdrawing water, and that hence, in accordance with the Ludwig theory, we must assume that a resorption of water occurs under normal conditions. The matter is, however, not quite so simple, for the salts, owing to their ability to withdraw water, also withdraw water from the tissues into the blood, thereby increasing the filtration stream through the glomeruli. Cushny further showed that fixed constituents, like sodium chloride, may be reabsorbed, as in the case of the intestines, by the epithelia of the tubules, that the difficultly diffusible Glauber salt was only slightly and slowly reabsorbed, and that finally urea is apparently not reabsorbed at all. A further striking example of such a renal diarrhœa, as I am inclined to call it, has been brought forward by Loewi. As I have already stated, every diuresis dependent on increased glomerulus filtration, occasions also an increased excretion of sodium chloride and urea. If one poisons an animal with phlorhizin, there also occurs an increased diuresis. This phlorhizin diuresis, as Brodie showed, appears to be wholly independent, in general, of the circulation and especially of the circulation through the kidney. And, what particularly interests us here, this diuresis is not dependent on the filtration of water through the glomeruli, for, according to Loewi's analysis, the chlorides and urea were not excreted in increased amount as is the case in all the other forms of diuresis. The phlorhizin diuresis must be regarded therefore as a pure tubular diarrhœa, brought about by the sugar excreted in the tubules of the kidney itself and there hindering the reabsorption of water by means of its water attracting properties.

We have, therefore, in many instances two closely connected processes which constitute the basis of increased diuresis: the interference with resorption from the tubules, and the increased filtration through the glomeruli, the latter being probably the more important factor. The question arises, What are the conditions that determine the operation of these factors? It may be that to a slight extent the diminished viscosity of the blood or, more properly, the degree of saturation of the colloids of the blood with water, are here concerned. We know that in thirsting animals the kidney secretion cannot be increased in any way; we have, therefore, no quantitative conception of the extent of this influence. On the other hand we know of one factor which is of determining significance for the process of filtration. This is the blood flow through the kidney. It was long ago shown by Roy that as a rule every diuresis is associated with an increase in the volume of the kidney, that is, sets in simultaneously with an increased blood flow, and the experiments of Roy have been repeatedly carried out with essentially the same results by numerous investigators, and especially by Gottlieb and Magnus and by Starling and Bayliss. Still it appeared from time to time that there were exceptions in which increased diuresis occurred in association with an unchanged volume or scarcely perceptible increase in the volume of the kidney. Gottlieb and Magnus, therefore, felt justified in concluding that the increased blood flow through the kidney is not the primary and determining condition for increased diuresis, but rather a regular and not essential associated phenomenon. My collaborator, Professor Loewi, also carried on a large number of experiments in this direction. He too found that in certain cases the oncometer showed no increase in the volume of the kidney, notwithstanding an increase in diuresis. We further undertook to determine whether diuresis occurred under the influence of diuretic agents like caffeine and salts even when the volume of the kidney was fixed so that an increased blood flow is presumably prevented. For this purpose the left kidney of the rabbit in a relatively quiescent and relatively anæmic condition was encased in plaster of paris with the exception of the hilus only, so that an increase in the volume of the kidney was wholly excluded. The surpris-

ing result was obtained that even in the case of such rigidly enclosed kidneys diuretics like caffeine and salts were able to induce an abundant diuresis. Hence it seemed to be actually true that an increased filtration may be induced without any increase in the blood flow through the kidneys. But more careful investigations showed that the volume of the kidney is by no means a certain measure of the blood flow through this organ, but that the volume of the kidney and the blood flow through it may be independent. For by inspection of the outflowing venous blood it could be seen that, notwithstanding the rigid limitation in the volume of the kidney, the flow of blood through the organ was always enhanced during diuresis. While the blood which flowed through the renal vein was dark previous to the diuresis, the stream took on a light, arterial color under the influence of caffeine and salts. The mere fact, therefore, that the kidney does not increase in size in some cases of caffeine diuresis is no proof that the process of diuresis does not depend on an increased flow of blood through the kidney, and one may say that an increased renal blood flow is a regular and essential condition of diuresis from salts, urea, and caffeine, a condition wholly sufficient, in itself, to explain the diuresis. It is not possible to say with certainty whether in the case of caffeine diuresis there is also a diminished resorption of fluid through the urinary tubules, as Sobieranski's experiments appeared to show. Another important fact was brought out by Loewi in this connection; we know that every hydræmia, whether induced by the administration of water or by the withdrawal of water from the tissues by means of salts intravenously injected. gives rise to an increased diuresis, without any increase in the general blood pressure or the work of the heart. What is the origin of such a diuresis? Loewi found that every hydræmia, whatever may be its origin, acts upon the vessels of the kidney as a specific excitant, in that it dilates the vessels and thus causes an increased glomerular filtration. Thus we have obtained an explanation for the increased secretion of urine arising from all forms of hydræmia, from the drinking of water, and from the withdrawal of water from the tissues, in consequence of the action of the diuretic salts. Hence we may say that all the observations that have come to us by physiological and pharmacological methods harmonize with the conception that the water of the blood and the free crystalloids therein dissolved are liberated from the glomeruli by the process of filtration or perhaps a process better described as transudation, and further that the urinary tubules reabsorb, by means of their epithelial cells, not only water but also, in cases of salt poverty, sodium chloride as well (these being materials which the organism cannot afford to lose), while at the same time these epithelial cells, like those of the intestines, have also to perform the duty of excreting the combined substances of the blood by means of their specific secretory activity.

Diuresis, therefore, represents the fusion of two principal processes—one concerning the glomeruli, which is in its main features mechanical in its nature; the other pertaining to the urinary tubules, which is not yet explicable on any physico-chemical hypothesis. The process of resorption from the urinary tubules has a distinctly biological, that is teleological character; water and salt are only reabsorbed when the organism does not possess these in excess. If one administers an abundance of water, the urine acquires a highly watery character, while after the administration of an abundance of sodium chloride there is a failure on the part of the tubules to reabsorb salt, as Loewi has shown. The process of reabsorption adapts itself, therefore, to the requirements of the organism.

Although I believe that the theory of renal function which I have here presented is the one which has the best experimental foundation, I readily concede that it leaves many facts still unexplained. For example, it is difficult by means of this hypothesis to explain the constitution of the urine in diabetes insipidus as well as the complete retention of chlorine under certain conditions, and I fancy that we shall have to suppose, as Cushny has done, that there is some kind of combination of sodium chloride with the blood tissue which hinders its filtration. The theory of diuresis and the action of diuretic drugs further possesses a practical interest. If, for example, it be true that caffeine acts diuretically through local specific dilation and not through irritation of the secretory cells, as was formerly supposed, then, as Loewi thinks, we are justified in its administration during long periods in the course of nephritis in which, in many instances, the vessels of the kidneys are abnormally contracted. And there is some reason to believe that the vasodilator action of the caffeine not merely induces an increased diuresis but exerts a favorable influence upon the pathological condition of the kidney itself.

In conclusion, I desire to express my appreciation of the courteous attention you have accorded me.

STUDIES IN TYPHOID FEVER.

SERIES I-II-III.

The papers on Typhoid Fever, edited by Professor William Osler, M. D., and printed in Volumes IV, V and VIII of the Johns Hopkins Hospital Reports, have been brought together and bound in cloth.

The volume includes thirty-five papers by Doctors Osler, Thayer, Hewetson, Blumer, Flexner, Reed, Parsons, Finney, Cushing, Lyon, Mitchell, Hamburger, Dobbin, Camac, Gwyn, Emerson and Young. It contains 776 pages, large octavo, with illustrations.

The price is $5.00 per copy. Address The Johns Hopkins Press, Baltimore, Maryland.

CARDIOGRAMS OBTAINED FROM A CASE OF OPERATIVE DEFECT IN THE CHEST WALL.

By Joseph Erlanger.

(From the Physiological Laboratory of the Johns Hopkins University.)

Historical Introduction.

Since the publication by Chauveau and Marey, in 1863, of the pioneer comparisons of the movements of the heart with the changes of the intracardiac pressure, cardiographic investigations on human beings have become almost a routine in the physiological laboratory and at the bedside. But despite the great amount of work that has been done we are still far from having a satisfactory knowledge of the form of the normal cardiogram and there is still much to be learned of the relation which the various features on the cardiogram bear to the events of the cardiac cycle.[1] The greatest difficulty in the way of the solution of these problems consists in the rigidity of the chest wall which lies between the heart and the receiving instruments. By it not only is the form of the cardiogram modified, but also the time relations of some of the features of the cardiac cycle may be altered. In order that data may be obtained which may serve as a means of interpreting the human cardiogram it is essential, wherever possible, to obtain tracings of the movements of the heart in all cases in which, for one reason or another, it is more or less freely exposed.

The number of satisfactory cardiograms that have been obtained from such cases of *ectopia cordis* is very small indeed. François-Franck[2] seems to have been the first investigator to have studied graphically the movements of the more or less freely exposed human heart. In 1877 he obtained beautiful and satisfactory tracings from a case in which a developmental defect permitted the heart to present in the sack of a ventral hernia. Some years later, in 1889, the same author had the opportunity of confirming his results in another exactly similar case.[3]

In 1879, Gibson and Malet[4] published tracings obtained from a pulsating tumor which presented in a congenital fissure of the sternum. These authors were unable to determine what part of the heart composed the tumor. Their waves seem to be made up of a combination of auricular and ventricular movements.

In 1882, v. Ziemssen[5] made a careful study of the movements of all of the chambers of the heart, excepting the right auricle, in a case in which the pericardium had been exposed as a result of the removal of a tumor of the chest wall. This case had been previously investigated by Grützner and by Filehne and Penzoldt.[6]

Macdonnell[7] studied the movements of the heart in a case with such lax abdominal walls that the hand carrying the receiving instrument could be inserted behind the heart. In this way he obtained tracings from the auricles and ventricles at different times. It is obvious that this method of obtaining tracings is much too uncertain to yield satisfactory results.

In 1898, tracings were obtained by Jarotzky[8] from the ventricles of a heart exposed by an operative defect in the chest wall and pericardium. It seems that the receiving instrument was held in the hand. At all events, the tracings that Jarotzky obtained are very irregular and, furthermore, his drum revolved so slowly that it is impossible to study the finer details of the curves.

Finally, we wish to refer to a case of *fissura sterni* which has recently been carefully investigated by Jaquet and Metzner.[9] This case was first studied by Jahn,[10] who made no tracings, and later by Penzoldt[11] and by Deuticke.[12] There seems to have been some difficulty in determining the identity of the parts of the circulatory system which presented in the fissure. Jahn and Penzoldt thought that the main pulsating tumor was the aorta, whereas Jaquet and Metzner and Deuticke believe it was the right ventricle. Jaquet and Metzner and Criegern[13] think that their X-ray examinations of the case support the latter view; but it should be stated that the X-ray examination made by Sternberg[14] at about the same time confirms the older view, namely, that the main pulsating tumor was the aorta.

Description of the Case.

The author has recently had the opportunity of studying the movements of the heart in a patient who had had a large part of the ribs on the right side of the chest removed for

[1] The literature on the normal cardiogram and a valuable discussion of the shortcomings of our knowledge of it will be found in an article by Tigerstedt: Ergebnisse der Physiologie, 1902, I, pt. II, p. 234.

[2] François-Franck: Trav. d. lab. d. Marey, 1877, III, p. 317.

[3] François-Franck: Arch. d. physiol. norm. et path., 1889, Ser. 5, I, p. 70.

[4] Gibson and Malet: Jr. of Anat. and Physiol., 1879-80, XIV, p. 1.

[5] v. Ziemssen: Deut. Arch. f. klin. Med., 1882, XXX, p. 277.

[6] Referred to by v. Ziemssen, l. c.

[7] Macdonnell: Practitioner, 1890, XLIV, p. 178.

[8] Jarotzky: Zt. f. klin. Med., 1898, XXXV, p. 301.

[9] Jacquet and Metzner: Deut. Arch. f. klin. Med., 1901, LXX, p. 57.

[10] Jahn: Deut. Arch. f. klin. Med., 1875, XVI, p. 200.

[11] Penzoldt: Deut. Arch. f. klin. Med., 1879, XXIV, p. 513.

[12] Deuticke: Ref. Jaquet and Metzner, l. c.

[13] Criegern: Münch. med. Wochenschr., Oct. 2, 1900.

[14] Sternberg: Verh. der physiol. Ges. zu Berl., Feb. 23, 1900, Arch. f. Physiol., 1900.

the treatment of empyema.[15] (See Fig. 1, which is a reproduction of a photograph of the patient.) Percussion indicated that the heart was but little displaced, and this is confirmed by a radiogram for which, together with some notes on the history of the case and the privilege of examining his tracings, the author is indebted to Dr. Yandell Henderson of New Haven. Owing to the emaciated condition of the patient the heart was covered laterally by but a thin layer of tissue—skin, mainly. Therefore, upon inspection it was almost possible to make out the form of the heart by the bulging which it caused of the thin layer of tissue overlying it. (See Fig. 1.) There could be seen a broad pulsating area extending from the prolongation of the upper border of the fifth rib to about the middle of the prolongation of the third interspace and between the anterior axillary line and the line formed by the projecting stumps of the amputated ribs anteriorly. Above this, about in the line of the third rib, there could be seen another more limited pulsating area. Palpation—it was almost possible to grasp the two regions of the heart—and the radiogram indicate that these pulsating areas were formed by the ventricles and auricles; and the cardiograms leave no room for doubting this conclusion. Furthermore, the fact that the position of the heart seemed to be but little altered from the normal, makes it appear more than probable that the lower and upper pulsations were produced by the left ventricle and auricle respectively.

METHODS.

The tracings were made with Marey's cardiograph. The *pelotes* were placed over the lowermost point of the lower pulsating area (over the cross in Fig. 1) and over the middle point of the upper pulsating area. The receiving instruments were rested on the patient's chest. In order to bridge over the flaccid part of the chest wall the supports of the instruments were greatly prolonged by soldering to them long, stiff, metal strips. For the most part simultaneous tracings were made of the upper and lower pulsating areas together with the time in fifths of seconds. In some experiments these were combined with a tracing of the brachial pulse made with the sphygmomanometer devised by the author, and of the time in fiftieths of seconds.

All of the many tracings obtained have essentially the same form. Three of them, each illustrating slightly different features, are here accurately reproduced (Figs. 2, 3, and 4). The upper and lower (or middle) tracings will be designated the auricular and ventricular cardiograms respectively. In Fig. 3 the lowest tracing is the brachial sphygmogram.

DESCRIPTION AND DISCUSSION OF THE TRACINGS.

In the ventricular cardiogram (Fig. 2) the line, 4-5, is undoubtedly produced by the contraction of the auricles. In time it corresponds accurately with e-f, which must, therefore, represent the diminution in the volume of the auricles during their contraction.[16] The volume of the auricles then immediately increases even before the ventricles begin to contract. This is probably due largely to relaxation of the auricles and possibly, in part, to a reflux of blood from the ventricles, plus bulging of the auriculo-ventricular diaphragm. This increase of the auricular volume continues through a large part of the period of rising tension of the ventricles, 6-7 (see below), and is probably caused by further bulging of the auriculo-ventricular diaphragm and by filling of the auricles from the veins. But the auricular volume begins to diminish (beginning 7-8-h) toward the end of the period represented by the line, 6-7, and the diminution continues for some time thereafter. This diminution in the volume of the auricles, or rather the negative wave occurring at this time, has been variously explained.[17] According to Porter[18] it is caused by a descent of the auriculo-ventricular diaphragm resulting from contraction of the papillary muscles. Mosso believes it is caused by an increase in the negativity of the intrathoracic pressure caused by the diminution in the volume of the ventricles. Whereas François-Franck attributes it to relaxation of the auricles. In our case, as well as in the case of François-Franck, the second explanation given above cannot be held; the chest wall was so lax that the diminution of the volume of the ventricles could not have altered the intrathoracic pressure materially. Neither is it necessary to assume that contraction of the papillary muscles causes this negative wave, because it may be seen in the veins in cases of heart-block where the contraction of the auricles may not be followed by contraction of the ventricles.[19]

The cause of the descent, 7-8, in the ventricular cardiogram is not clear, unless it is due to a movement of translation of the whole heart. It was at first thought that it might have been caused by the diminution of the volume of the ventricles which occurs after the opening of the semilunar valves. But it may be seen in Fig. 3 that the aortic valves open presumably at some point near the foot of this descending line; for when the correction is made for the time lost in transmission of the pulse-wave to the brachial artery,[20] the arterial pulse

[15] The thanks of the author are due to Dr. Thomas R. Brown for calling his attention to this case.

[16] As is well known, the form of the cardiogram is determined by a combination of volume and pressure effects, and the form of curve obtained depends to a certain extent upon the pressure exerted on the heart by the receiving instrument. As this pressure cannot be nicely controlled it becomes practically impossible to distinguish pressure from volume changes. For the sake of convenience we shall usually refer to changes of tension in the tambour system and of the movements of the lever corresponding therewith as volume changes of the heart.

[17] Most of the literature on this subject will be found in Gerhardt: Schmied. Arch., 1894, XXXIV, p. 402.

[18] Porter: Jr. of Physiol., 1892, XIII, p. 513.

[19] Erlanger: Am. Jr. of Physiol., 1905, XIII, p. xxvi.

[20] The rate of transmission of the pulse-wave in the brachio-radial artery of this case was 6.8 meters per second. The distance of the place on the arm from which the sphygmogram was obtained was approximately 35 cm. The delay would, therefore, be approximately equal to 1.8 divisions on the time record.

begins at a point marked x on the ventricular cardiogram. Indeed, it seems to correspond with, or, perhaps, to come a trifle earlier than, the break in the curve at this place. But be that as it may, it is obvious that the period of rising tension extends from 6 to, at least, x.

The plateau stage of ventricular contraction now follows. On the declining plateau, which extends from 8 to a point beyond 11, there may be seen two distinct undulations with their crests at 9 and 11. Shortly before the beginning of this stage of ventricular contraction, the volume of the auricles begins to increase, the increase, h-m, outlasting slightly the plateau stage of ventricular contraction. Between h and m there may be seen three undulations, two of which, h-j and j-l, correspond in time with, and have the same sign as, the undulations 8-10 and 10-11 + on the ventricular cardiogram. It seems improbable that these waves are the result of instrumental error because the two recording instruments, while executing different motions, record the same waves. These waves have been frequently seen on intraventricular pressure curves and cardiograms obtained from animals,[1] and they are present on the human cardiogram made by François-Franck. Marey attributes them to waves in the heart generated by movements of the column of blood in the arteries, whereas Fredericq thinks these undulations are caused by the contraction of the heart muscle in three stages. By some they are believed to be artefacts of unsatisfactory instruments.

Ventricular relaxation begins at some point beyond 11, probably at l, and extends to 12. At the point marked l, a slight indentation may be seen in both the auricular and ventricular curves. It is indistinct in Fig. 2 because here the wave, 11, passes almost indistinguishably into the line which marks ventricular relaxation. But in Fig. 3, where the excursion of the lever was less than in Fig. 2, there can be no doubt but that ventricular relaxation begins at l. The volume of the auricles begins to diminish at the point marked m on the ventricular cardiogram. This point, therefore, indicates accurately the position at which the pressure in the ventricles falls below the intra-auricular pressure, *i. e.*, it marks the moment of opening of the auriculo-ventricular valves. It is interesting to note that this event is associated with no obvious sign on the ventricular cardiogram. But it should be stated here that in ventricular cardiograms obtained from animals, a small wave is often seen on the curve in just about the position at which, in our tracings, the auriculo-ventricular valves open. And Fredericq believes that this wave is caused by the flow of blood from the auricles into the ventricles when these valves open.

The auricular volume continues to diminish (latter part of m-n) for a short while after the completion of ventricular relaxation (after 12). During this period the volume of the ventricles increases very rapidly, 12-2. Possibly this is due to the pouring into the ventricles of the blood which has accumulated in the auricles during the period of closure of the auriculo-ventricular valves. The auricular volume then increases, rapidly at first, b-c, but soon the curve reaches the summit of a more or less horizontal plateau, c-e. On this plateau there are, at c and e, two gentle undulations. During this phase of the cycle the ventricular volume increases very slowly, 2-4, and this curve likewise shows two undulations which correspond more or less accurately with c and e. The origin of these waves is not known, but it seems possible that the wave e which immediately precedes the auricular contraction might be caused by contraction of the great veins or by a slowly beginning auricular contraction.

In Fig. 3 it may be seen that the dicrotic notch of the arterial pulse-wave corresponds in time with about the middle point of the line, 11-12, which represents ventricular relaxation. The ventricular curve is not affected by it.

It should be mentioned that these tracings do not show the intersystole described by Fredericq in cardiograms obtained from animals, and pictured by Jaquet and Metzner in a cardiogram obtained from man.

TABLE GIVING THE TIME RELATIONS OF THE VARIOUS FEATURES ON THE TRACINGS OF FIGS. 2, 3 AND 4.

No. of cardiac cycle	Duration of A systole e-f	Duration of As-Vs interval 4-6	Duration of period of rising tension 6-8 (?)	Duration of V plateau 8 (?)-1 (?)	Duration of V relaxation 1 (?)-12	Duration of heart pause 12-4	Duration of cardiac cycle 1-12	
4	.06	.14	.12 +	.32	.04 +	.34 +	1.	Fig. 2
5	.06	.14 +	.12)	.32	.06	.6 −	1.06	
6	—	.12 +	.12 +	.32	.06	—	—	
2	.07	.12	.123	.27	.05	.36	.9	Fig. 3
3	.1 −	.08	.18	.22	.06	.16	.78	Fig. 4
4	.06 +	.1	.16	.24	.08	.16	.76	
5	.1 (?)	.14	.16	.24	.08	.24	.84	
6	.1	.14	.16	.24	.06	.32	.90	
7	.1	.14	.16	.24	.04	.36	.98	
8	.08	.12	.16 −	.26	.06	.42	1.02	

Attention should be called to the relation on the ventricular cardiogram of the curve of auricular contraction to that of ventricular contraction. In most of the tracings there is a distinct notch between these two features. But it may be seen that in the early parts of Fig. 4 the two waves are almost merged into a single, unbroken, ascending line. This is somewhat exaggerated in the figure because in the earlier portions of the tracing the drum was revolving more slowly than later. But accurate measurement shows that the interval between the beginnings of auricular and ventricular contractions were increasing while the tracing was being made. It is, therefore, obvious that under certain circumstances the two curves might actually be indistinguishably merged. In such a case it would be impossible to determine from a study of the ventricular cardiogram alone the moment of the beginning of ventricular contraction.

It may also be seen that in Fig. 4 the length of the phase

[1] See Tigerstedt, l. c.

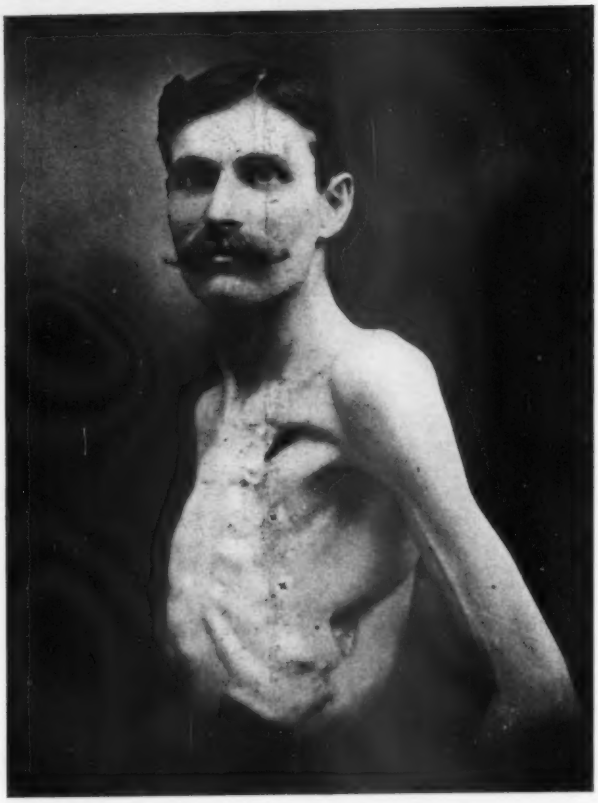

FIG. 1.

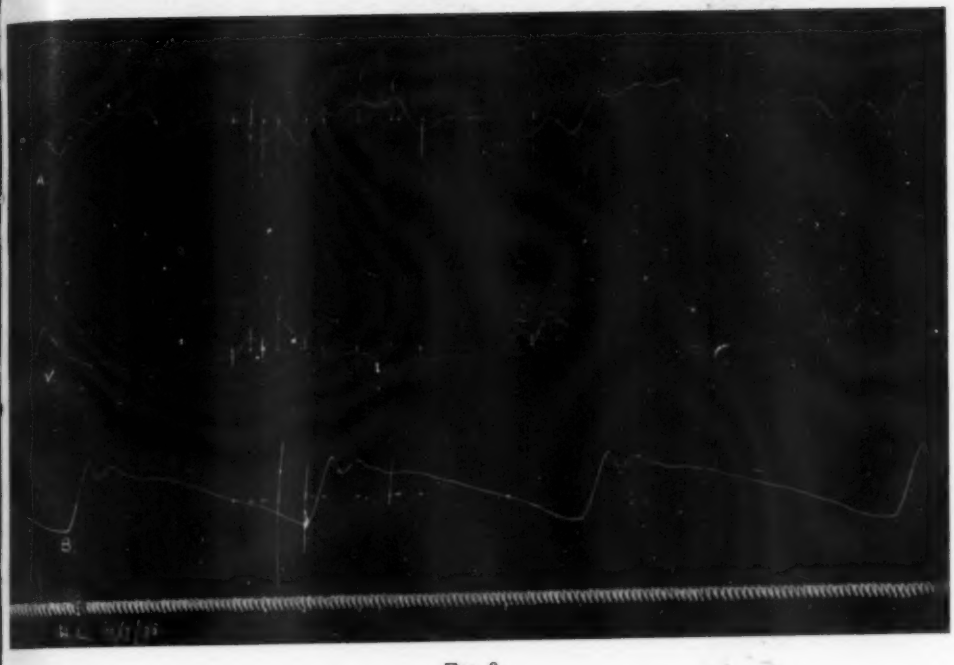

FIG. 3.

of the cycle which corresponds with the interval, b-e, of Fig. 2 was rapidly increasing while the tracing was being made. This phase corresponds with the so-called heart-pause—no active movements of the auricles or ventricles occur at this time; it is the phase of the cardiac cycle which is most affected by variations in the heart-rate. Inspection of the table will show that here the heart-rate was rapidly diminishing and that, although practically all of the phases of the cycle were correspondingly lengthened, it is the heart-pause which was most markedly affected.

In the table on the preceding page are given the analyses of the curves used to illustrate this article.

I. FIBROMA OF THE ABDOMINAL WALL; II. PRIMARY CARCINOMA OF THE RIGHT FALLOPIAN TUBE; III. AN ACCESSORY AND TWISTED OMENTUM.[1]

DETAILED DESCRIPTION OF CASES REPORTED BEFORE THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY, APRIL 3, 1905, BY DR. CULLEN.

I. Fibroma of the abdominal wall springing from the sheath of the external oblique (Fig. 1).

Mrs. H. M., 30 years old, was referred to me by Dr. Howard Bratton, of Elkton, Md., on Feb. 5, 1905. About three years ago she noticed a very small lump in the left side just beneath the ribs. This increased slightly in size for over two years, but during the last few months has grown rapidly. She thinks she is losing some in weight. On examination a kidney-shaped mass was found just below the free margin of the rib and on a line with the nipple on the left side. It was fairly movable and seemed to be just beneath the skin. On making an incision over it we found that the growth sprang from the sheath of the abdominal muscles, and lay between the muscle and adipose tissue. It was 13 cm. in length and varied from 8 to 10 cm. in breadth. It was lobulated and on its outer margin had a deep hollow that might readily be mistaken for the pelvis of the kidney.

Pathological Examination (Gyn.-Path. No. 8290).—The growth varies from 4 to 6 cm. in thickness. In some places it is covered by fat, but on the under surface over a wide area it is intimately blended with the muscle (Fig. 1). It is exceedingly hard and on section bears a striking resemblance to a fibroma. There is a definite and somewhat globular nodule forming about half of the tumor. This portion is somewhat homogeneous, is slightly yellowish in color, and at first suggests the possibility of sarcoma.

On histological examination the growth proved to be a typical fibroma. The nuclei were oval, spindle-shaped or irregular, and stained fairly deeply. The blood supply seemed abundant. We failed to find any areas suggestive of malignancy.

II. Primary carcinoma of the right Fallopian tube (Fig. 2) *with secondary involvement of the uterus, both ovaries, pelvic peritoneum, omentum, and rectum. Removal of omentum, uterus and appendages, one-third of the pelvic peritoneum, and six inches of the bowel. The patient was comfortable and considered herself well, five months after operation. The respite was, of course, only temporary.*

Mrs. Z. was seen in consultation with Dr. J. Milton Linthicum, Jan. 5, 1905. The patient was 55 years of age. She was sparely built, fairly well nourished, but slightly anæmic. For months she had had some hemorrhage from the uterus and later great pain on defecation; in fact her discomfort had been so great that she said she could not endure it much longer. On examination, under anæsthesia, I found the uterus slightly enlarged and on the right side a firm mass about 6 cm. in diameter. I thought it to be a myoma.

Jan. 7.—On opening the abdomen I found the omentum everywhere studded with nodules, some of them being very small, others 1 cm. or more in diameter, and umbilicated. I questioned the advisability of operating, but Dr. Linthicum thought it wiser to operate, as the patient said "she would rather die than go through the torture that she had been experiencing for several weeks." The omentum was separated close to the transverse colon, as in the vicinity of the colon no metastases were to be found. The right tube was much enlarged and apparently involved in a malignant growth. It was attached to the pelvic floor and the peritoneum at this point, over an area fully 5 by 6 cm., was involved in the process. On the right side the ureter ran directly beneath the thickened peritoneum. On the left side the ovary, although small, was glued down to the pelvic floor directly over the ureter. Posteriorly the uterus was firmly attached to the rectum. It was found necessary to carefully dissect out the ureters first, as it was evident that much of the pelvic peritoneum must be removed. The hysterectomy was carried out practically along the lines laid down by Wertheim's operation. Fully one-third of the pelvic peritoneum, however, was removed. I had hoped to remove part of the rectum with the uterus in one piece, but found that it was impossible. Consequently it was necessary to separate the uterus from the rectal growth. The rectum was freed on all sides, care being taken, however, not to interfere with the blood supply. The patient was then placed in the perineal position and the skin

[1] A brief report of these cases appeared in the BULLETIN for June, 1905, p. 237.

separated from the rectal mucosa, just as is done in a Whitehead operation. Six inches of the rectum were drawn down through the sphincter and cut off and the upper edge of the rectum was sutured to the skin. The ureters were covered over as far as possible with the remaining peritoneum. A medium-sized gauze drain was introduced into the pelvis and brought out through the vagina. The entire operation took a little more than three hours. The patient had a very feeble pulse when she left the table, which was not surprising, as she was in a weak condition at the commencement of the operation.

Jan. 8.—The patient is improving greatly. Her pulse is 126, temperature normal, respirations about 30. This evening there has been considerable vomiting. Sixteen ounces of water were ordered with the hope of washing the stomach out. She vomited four ounces, fortunately retaining the

Subsequent history.—During the spring and part of the summer she was free from pain, journeyed to distant points, and looked very well. About the middle of August she became rather weak; after seven days' rest in bed she suddenly grew worse and died in half an hour. From the symptoms it is possible that death was due to embolism. The operation relieved her of great suffering and gave her over six months of comparative comfort.

Gyn.-Path. No. 8114. The specimen comprises the uterus and enlarged right tube, both ovaries, the small left tube, and a cuff of pelvic peritoneum, the greater part of the omentum, and several inches of the rectum.

The uterus has been removed entirely. It is 7 by 5 by 3.5 cm. and is covered by numerous adhesions. The uterine cavity is of the normal size. The mucosa is thinner than usual and shows nothing of interest.

FIG. 1.—FIBROMA SPRINGING FROM THE APONEUROSIS OF THE EXTERNAL OBLIQUE, AND LYING BETWEEN THE MUSCLE AND THE SKIN.

The under or posterior surface of the tumor is shown. The growth bears some resemblance to a kidney in its general contour; on its lower surface is a depression which on palpation might readily be mistaken for the renal hilum. Attached to the tumor is some muscle, also a moderate amount of fat.

twelve. There have only been about 70 cc. of urine in twenty-four hours, but the general condition does not seem to indicate any uremia.

Feb. 1.—The patient has steadily improved since operation. There has been a great deal of discharge from the pelvis, but that is rapidly diminishing. She occasionally has a temperature of 101° F. The sphincter action at first was rather tardy, but is now much better.

March 1.—The patient is up and around and suffering little or no discomfort. Of course, a complete recovery is out of the question. The operation was performed merely to relieve her intense suffering.

The right tube at the uterus is 3 mm. in diameter. After passing outward 1.5 cm. it suddenly increases in size, reaching a diameter of 1.8 cm. It gradually increases until near the fimbriated extremity it is 4 cm. in diameter. The entire length of the tube is approximately 12 cm. It is for the most part smooth, but at two points on its inner aspect the muscular coats have given way and we have hernial spaces .8 by 1.8 cm. in diameter covered only by peritoneum (Fig. 2). The under surface of the extremity of the tube is roughened where it has been attached to the peritoneum of the pelvic floor. The tube was not opened until hardened. Sections near the uterus show that the lumen is fully 1 cm. in diameter

and that it is filled with a friable, porous, granular looking growth which is free on the under side, but intimately blends with the upper or convex side of the tube. Sections near the outer end of the tube show that the walls are not over 1 mm. in thickness. Here also the tube lumen is filled with a similar friable growth which is whitish yellow or mottled, evidently as a result of old hemorrhages. The tube itself is nearly as large as the uterus.

The left tube is about 5 cm. in length, is slightly beaded, and varies from 3 to 5 mm. in diameter. The fimbriated end is patent and the tube has grown fast to the lower and outer end of the right tube. The right ovary is very small, is approximately 1.5 by 1 by 1 cm. The left ovary is also atrophic, being

of the portion removed, in its fresh state, was about six inches. The rectal mucosa is smooth and apparently normal. The constriction was due to infiltration of the adipose tissue surrounding the rectum. The nodules in the omentum, as noted in the clinical description, are firm. Some of them reach fully 3 cm. in length.

Histological examination.—Sections from the uterus show that the surface epithelium is intact. The glands are normal. At numerous points the muscle is becoming active and growing up into the stroma. It shows us fairly well how an adenomyoma may develop from an in-growth of the muscle fibers.

Sections from the tube near the uterus show that springing from the upper wall of the tube is a new growth, as indicated

FIG. 2.—PRIMARY CARCINOMA OF THE RIGHT FALLOPIAN TUBE. (Natural Size.)

The right tube at the uterus is normal in size. It soon, however, suddenly becomes much enlarged, is somewhat lobulated, and finally terminates in an occluded fimbriated end 4 cm. in diameter. For the most part it is smooth, but at several points are cyst-like elevations. Here all the muscular coats of the tube have given way, and there is bulging of the tubal peritoneum. The tubal growth is solid and granular as seen where the tube is incised. Attached to the lower surface of the tube is a large flap of pelvic peritoneum.

The left tube is small, passes backward and joins with the occluded and enlarged right tube.

Both ovaries are very small, but on histological examination they were found riddled with cancer. It was impossible to satisfactorily remove the extensive carcinomatous growth of the tube and six inches of the bowel without also doing a complete hysterectomy.

2 by 1.5 by .6 cm. Attached to the right side of the cervix is an irregular area of peritoneum which was approximately 7 by 6 cm. The central portion of this is hard and indurated, the outlying portions are smooth.

The rectum is atrophied to a considerable extent. The length

in the gross description. The lower part of the tube is free. Projecting from the side of the tube where the lumen is free are little finger-like outgrowths lined by a single layer of delicate epithelium. The nuclei are oval and vesicular. Some of the nuclei stain very deeply and are rather increased in size.

They immediately remind one of a malignant growth. Springing from the wall of the tube and filling almost the entire cavity is a papillary growth. The stroma of the out-growth consists of spindle-shaped connective tissue. The epithelial covering is one or many layers in thickness. In numerous places the epithelial covering has greatly proliferated, so we have solid masses of cells many layers thick. Here also there

FIG. 3.—TORSION OF AN ACCESSORY OMENTUM.

This accessory omentum was attached near the junction of the ascending and transverse colon and was absolutely independent of the normal omentum. The lower border gives its relative breadth. It has become twisted on itself from right to left several times. At the points of twisting the tissue was bluish black. The pedicle is very small. We have unfolded the lower border in order that the omental structure may be more clearly seen.

On histological examination the tissues presented the typical picture of omentum; the vessels were, however, thrombosed and there was considerable extravasation of blood into the fat.

are large and deeply staining nuclei. In the deeper portion of the growth the connective tissue predominates and we have solid nests of cells. The epithelium tends to retract from the connective tissue. At numerous points large areas of

the growth have undergone coagulation necrosis and we have fragmentation of the nuclei. The outer muscular wall in most places is still preserved. At some points, however, the entire thickness of the tube has been involved by the growth. Sections from the outer portion of the tube yield practically the same picture. The papillary arrangement is particularly well marked and many of the nuclei are spindle-shaped or irregular, very large and deeply staining. In some sections fully three-fourths of the field have undergone coagulation necrosis. In such areas only a few of the cells around the larger blood vessels still retain their vitality. Scattered

throughout the muscular walls of the tube are definite masses of growth chiefly in the form of cell nests or penetrating glands and on the outer surface of the tube are little bunches of new growths. We have undoubtedly a primary carcinoma of the Fallopian tube with a penetration of the entire tubal wall at numerous points.

Sections from the right ovary, which was very small, show that the organ in some places is normal, but at many points it has been penetrated by masses of carcinoma which send out branches in all directions. The cells present exactly the same characteristics and are manifest in the depth as well as on the surface. Here also there is some breaking down. The left tube near the uterus is practically normal. The left ovary, although also very small, shows diffuse infiltration by the growth. The structure is recognized as typical, carcinomatous glands or as isolated, large, irregular cells with irregular and deeply staining nuclei; in fact the ovary is riddled by the growth.

Sections from the omentum show a most typical picture. In such areas the fat of the omentum is to a great extent replaced by young and old connective tissue, and lying in the connective tissue are masses of epithelial cells, very solid, with a definite glandular-like arrangement. The same large, deeply staining and irregular nuclei are also here in evidence. The nuclear figures are particularly well formed. Rarely do we find a mass of cancer cells in the omentum without a well-defined area of commencing connective tissue development as in this omentum. We find considerable hemorrhage and also breaking down of the carcinomatous elements. The only extension to the rectum is by continuity from the outer surface. The rectal mucosa has not been involved.

Diagnosis.—Primary carcinoma of the right Fallopian tube with extension to the peritoneum of the pelvic floor, to both ovaries, and also to the rectum by continuity, general pelvic adhesions; extensive metastases into the omentum.

For a further discussion of the various forms of cancer of the tube, we would refer the reader to Dr. Elizabeth Hurdon's article, published in the JOHNS HOPKINS HOSPITAL BULLETIN, Vol. XII, p. 315, 1901, and to the recent article by G. J. Tomson, published in La Gynécologie in February, 1905.

III. Torsion of an accessory omentum (Fig. 3) *producing symptom simulating appendicitis. Recovery.*

Mr. E. S. was seen in consultation with Dr. Wm. Wright on March 12, 1905. He is a railroad conductor, 47 years of age, and weighs 180 pounds, has a florid complexion, and is very stout for his height. About six days ago, while upon his train, he found it necessary to put off a drunken man, who suddenly turned and whirled the conductor around twice. Next day he felt a little discomfort in the region of the stomach; on the following day pain over the appendix. When I saw him all abdominal rigidity had disappeared. There was, however, a temperature of 101.5 degrees and his pulse was 100. On examination of the blood it was found that there was a marked diminution in the eosinophiles and a leucocytosis of 17,600. On examining the patient under anæsthesia I failed to find any thickening over the region of the appendix. Nevertheless, I made a gridiron incision, deeming an exploratory section necessary. The appendix was found somewhat thickened and slightly adherent; it was removed. On further examination I found a large area of induration on the right side extending half way between the anterior superior spine and the ribs. The incision was accordingly continued upward as far as the free margin of the ribs. The omentum was found adherent. In order to wall off the parts thoroughly I severed the omentum near the thickening and walled off with gauze. The adherent portion of the omentum was now loosened and removed without any difficulty and with no hemorrhage. On carefully manipulating the area of induration, which was at about the junction of the ascending and transverse colon, I was able to loosen up a very strange looking mass which had a mottled appearance, was grayish yellow, and had fine reddish markings all through it (Fig. 3). One of the doctors present suggested hemorrhagic pancreatitis. On following this mass down to the pedicle, which was about 1 cm. in breadth, it was found to contain two small blood vessels. The mass was tied off and removed. It was situated just to the outer side of the jejunum and was slightly adherent to the gall bladder and had become twisted upon itself and was becoming gangrenous. When unfolded it was found to consist of tissue in no way differing from omentum. Where it had been folded upon itself the parts looked gangrenous. These areas were bluish black in color. The gall bladder was normal.

The patient made a very satisfactory recovery. When last seen, in October, he was in excellent condition.

Gyn.-Path. No. 8114. The entire specimen is fan-shaped when partially unfolded. It is 14 cm. in length, and at the lower margin reaches 12 cm. in breadth. The edge is sharp. On section the hardened specimen is brownish-black, evidently due to thrombosis of the blood vessels.

On histological examination the growth proves to be omentum. The blood vessels are much distended and the blood is apparently coagulated. There is considerable hemorrhage into the adipose tissue surrounding the vessels.

In this case the symptoms were very suggestive of appendicitis, and without an exploratory operation the true condition of affairs could not have been ascertained. With the abdomen open this hard growth felt very much like a nodular, carcinomatous mass, and even when the incision had been lengthened inspection of the growth strongly suggested malignancy or acute pancreatitis. An accessory omentum is, to say the least, a very rare condition. Had this accessory omentum remained in much longer, total gangrene would undoubtedly have occurred.

A CASE OF SARCOMA OF THE EYE, INVOLVING CHIEFLY THE CILIARY BODY.[1]

By Paul G. Woolley, M. D.,

Director Serum Laboratory, Manila, P. I.

(From the Government Biological and Serum Laboratories.)

For the history of the following case, and for the small growths removed from the site of a previous operation, I am indebted to Captain Stiles, Assistant Surgeon, U. S. Army.

The pathologic specimen was sent to the Biological Laboratory in Manila from the Civil Hospital.

The case was that of one T. F. H. D., an officer in the Philippines Constabulary, who on the 13th of January, 1903, was struck in the eye by a bamboo stem. A thorn of the stem penetrated the right lower lid near the outer canthus, without, so far as can be determined, injuring the globe. Some inflammation of the lid and conjunctiva followed the injury, but this was transient and the part remained apparently well until March 10, 1903, about two months after the injury. At that time, following hard work in the field, the patient experienced some photophobia, but he noticed no impairment of vision. Toward the end of April, *i. e.*, in the fourth month after the injury, he began to have slight pain in the globe, with severe headaches, and vision was so impaired that the eye could not be used for aiming firearms. From that time on vision steadily became worse. By the middle of July there remained only light perception, and the pain in the globe was so severe that sleep was interfered with. The patient was then transferred to Cebu for treatment. Before he reached that point, however, vision had improved to a slight extent, but the pain was undiminished.

On August 19, 1903, about seven months after the injury, the man was admitted to the Civil Hospital in Manila. At that time the pain in the globe was constant and severe, he had considerable headache, and of vision there remained but light perception. Ten days later the injured eye was totally blind.

On September 23, 1903, somewhat more than eight months after the injury, the right eye was enucleated. Convalescence occurred with no complications.

Six weeks after operation a small mass of granulation tissue appeared in the line of the cicatrix in the conjunctiva. This increased slowly, and on one occasion bled spontaneously but only enough to stain the conjunctival secretions. About six weeks later (December 22) another small mass appeared to the outer side of the first growth.

When he was seen by Dr. Stiles on January 4, 1904, there were two rounded masses of soft tissue, each about 3 mm. in diameter, growing from a common pedicle which measured less than 1 mm. in width, and springing from the cicatrix resulting from the "pucker string" suture of the conjunctiva made at the time of enucleation.

These growths were of the color of the rest of the conjunctiva, were not macroscopically vascular, and not at all painful. The growth of the outer and more recent of the two masses had been much more rapid than that of the original one, and the two growths were of about equal size when seen. The patient said that he had had some pain in the head, back of the eye, but none in the orbit itself.

The lower palpebral conjunctiva was slightly follicular, and there was free purulent secretion from the orbit.

These growths were removed, the pedicle touched with pure carbolic acid, and the orbit irrigated for two days. The growth proved, upon microscopic examination, to be composed of granulation tissue infiltrated with leucocytes, and with no evidence of any other neoplastic process.

The right eye, sent to the Biological Laboratory, had been opened and showed a thickening, extending over three-fourths of the circumference of the eye and localized distinctly (macroscopically) to the region of the ciliary body and the immediately adjacent portions of the chorioid. The growth was thickest just posterior to the corneo-scleral junction and just at the insertion of the iris, *i. e.*, in the region of the ciliary body. It was whitish in color and had no macroscopic evidence of pigmentation. In one place there was some staining as from hemorrhage.

Pieces of the tissues were fixed in Zenker's solution, imbedded in celloidin, and stained with hæmatoxylin and eosin, safranin, methylene blue, thionin, and Mallory's stain for reticulum.

The cornea and retina showed no variation from normal. The blood-vessels of the conjunctiva were distended and there were small hemorrhages into the substance of that layer, and into the subconjunctival tissues. About the deeper vessels there was a well-marked infiltration with round cells, which in their arrangement in more or less definite rows and from their position about these blood-vessels seemed to have some relation to the perivascular lymph spaces. The nuclei of these cells were for the most part deeply stained, but the protoplasm was relatively abundant. Other cells showed all the characters of the lymphoid cells of small round-celled sarcomas. These lines of cells were separated by a well-developed fibrous tissue.

The sclera was normal except in the region of the corneo-scleral junction where there were occasional lines of the cells described above, and these were also present about the blood-vessels and along the lymph spaces. This infiltration with

[1] Read at second annual meeting of the Philippine Islands Medical Association, March, 1905.

round cells was especially well marked in the region about the canals of Schlemm.

The chorioid was involved in the small-celled infiltration and the whole width of this coat was involved for at least a centimeter posterior to the ciliary process. The infiltration farthest from the ciliary body was confined to the inner layer of the chorioid. In these inner parts of the chorioid layer the growth showed a considerable number of pigmented cells, of spindle or angular form and evidently of connective tissue origin.

In that part immediately in the neighborhood of the ciliary body the growth had an appearance unlike that seen in other parts of the tumor. There, at first sight, the picture was that of a small, round-celled sarcoma, but another type of cells was also present, cells that were separated by healthy looking connective tissue into alveoli and columns. Many of these cells were typically epithelioid in appearance and strongly resembled those of perithelial sarcomas. The growth was certainly not endothelioid in the narrow sense of the word, and in no place was there any evidence of vascular endothelial proliferation. The individual cells were polyhedral, with abundant protoplasm that stained well with acid dyes, and had round vesicular nuclei. They are probably of perithelial origin. There was no increase in the muscular elements, no evidence of myomatous growth, and in cross and longitudinal sections the Mullerian fibers appeared normal.

It was in the sections stained by Mallory's method that most light was shed upon the nature of the tumor. In such preparations it was seen that there was a well-marked and complete intercellular reticulum. This reticulum was so arranged that certain of the cells were arranged in complete columns, between the individual cells of which there was a very delicate meshwork. The reticulum between the columns was coarser. But in other places there was a complete lack of orderly arrangement, and in such areas the cells were closely packed together, but each one was surrounded by a very delicate reticulum.

I incline to the opinion that in this tumor two types of tissue participated, one a pure undifferentiated connective tissue, the other perithelium, *i. e.*, those cells forming the lymph spaces about the blood-vessels.

In the literature on tumors of the eye, to which I have access, there are comparatively few cases of leucosarcomas originating in the ciliary body. Parsons (Arch. Ophthal., 1903, LV, 350) gives a short resumé of certain of these cases, but with especial reference to the so-called "ring-sarcomas" of which, in a way, the present case is an incomplete example. In all probability if the growth in this case had been allowed to proceed for some little time longer the whole circle of the ciliary body would have been involved. Parsons' case was one of spindle-celled sarcoma in a youth 14 years old, and was circumstantially inaugurated by a blow upon the eye.

In Jano's case, so far as Parsons' abstract is concerned, at least, no cause is given to account for the growth, which occurred in a 10-year-old girl and which was composed of spindle cells, and with, apparently, no involvement of the chorioid.

Hoensell and Fienzel reported a case of sarcoma in a woman aged 43.

Groenouw's case occurred in a man 28 years old, following a blow upon the eye. The tumor was first noticed three weeks after the trauma. In this case the cells composing the growth were of endothelial origin.

The case reported by Kerschbaumer occurred in a man of 27 years, and was composed of large round and oval cells.

Myerhof observed an unpigmented tumor in a man 72 years old, and also a circumscribed alveolar endothelial sarcoma of the ciliary body in a man of 50 years.

These cases with his own are the ones which Parsons thinks the only ones of undoubted leuco-sarcomas of the ciliary body. To this list may be added, I think, the case reported here, for here as in Parsons' case the true tumor cells are unpigmented, and the cells that show granules of pigment are in direct relation to the pigmented portions of the eye. Moreover, they have none of the character of the tumor cells. But there is a certain unique feature in this tumor in its composition of cells of connective tissue origin and others of apparently perithelial derivation.

As for the etiology of sarcomas of the uveal tract, there is some difference of opinion. In the present case, at least, the growth may be referred to the injury caused by the bamboo thorn. But in the statistics of Treacher Collins, trauma could be established in but seven cases of 103, or 6.79 per cent.

Seven months after the enucleation I met the patient at his post in one of the provinces. He was perfectly well, with no sign of recurrence and no symptoms of any disturbance about the wound or orbit.

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RENAL DECAPSULATION IN NEPHRITIS, WITH REPORT OF A CASE.[1]

By Henry Harris, M. D.,

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Upon the clinician falls the work of deciding whether renal decapsulation in Bright's disease is of value. For this form of treatment has certainly gained sufficient favor to be always considered in any case of this disorder. Upon the clinician will also fall the decision concerning the advisability of operation, because to him the patient first comes. The subsequent results in every case are of value to the profession, especially from the clinical side. For the operation being over, our judgment of the result is based on data obtained through methods of clinical diagnosis. A careful diagnosis of cases operated on has not always been made; this is particularly apparent in the early cases reported.

Any discussion concerning the pathology of renal decapsulation seems at present premature and unnecessary. Whether by lowering renal tension, by establishing collateral circulation, or through beneficial nervous influence the desired result occurs, is undecided. More autopsies on such subjects, particularly on those dying by accident or by intercurrent disease, will ultimately help to decide this question, if it does not entirely decide it. Animal experiments done with the view of studying the effects of decapsulation have shown that a new capsule is formed in dogs and rabbits in about three weeks. On fifteen dogs Dr. H. Johnson (1) showed at autopsy that sufficient anastomosis had not occurred between renal and perirenal blood vessels to influence the renal circulation. His results are well known in this country. Quite opposed to his findings are those of H. Stursberg (2) (Bonn), and of B. Asakura (3) (Berne), results which are not so well known in this country.

Stursberg, attempting to imitate the nephritic conditions found in man, treated dogs and rabbits with doses of potassium chromate. He does not believe, however, that the chromate exerted any actual influence on the result of his experiments. In from four to nineteen weeks after decapsulation the animals were killed by bleeding from the carotids, were then hung up with the head downward, further ridding the body of blood, and then they were injected through the aorta with a gelatine mixture. Especially in those cases where nephropexy had been done, it was possible to make out a considerable increase of capillaries and even an increase of larger vessels. This might be seen macroscopically, but was easier to discern microscopically. Not alone could the injecting fluid be pushed from the kidney outward, but even with the renal vein and artery cut off the fluid penetrated from without inward along small branches as far even as the medullary substance. On a normal animal the last procedure also showed a penetration of the injecting fluid, but not in the same degree. He therefore believes that by decapsulation sufficient new formation of blood vessels occurs between kidney and its surrounding parts to actually influence the flow of renal blood, at least in animals. If the renal circulation be faulty, the result might be more marked. He thinks, too, the operation in man acts beneficially because of the new formation of blood vessels, though in acute cases relief of tension is also a factor.

Asakura also found a considerable anastomosis to have occurred after renal decapsulation on rabbits and dogs. His work was, however, rather directed towards showing that the procedure was without particular danger to the kidney. Seven days after the operation slight evidences of renal trauma were found, consisting of small hemorrhagic areas with pus cells. He tested also the resistance to bacterial infection of rabbits whose kidneys had been decapsulated. Such animals actually lived longer than control animals not operated on. Even if the kidney were already infected by pyogenic organisms and decapsulation was then performed one, two, or three days after inoculation of the rabbit, the animals lived just as long as control animals whose kidneys had not been decapsulated. Still after all has been said from the experimental side the question as to the ultimate value of the operation must rest on clinical experience.

Clinical experience with this procedure has now grown to very respectable proportions, the literature being quite vast. The names of Edebohls, Ferguson, and Reginald Harrison must be referred to in this connection as pioneers. An extensive bibliography is here superfluous; for this the reader is referred to a paper by G. F. Suker (4). The value of treatment of decapsulation is disputed by many; Rovsing (5) (Copenhagen), for instance, claims that the apparent benefit following operation is due entirely to the rest in bed. This is in contrast to the optimism shown by others, Edebohls (6), Guiteras (7), Tyson (8). A study of the literature will show, however, a growing belief in the efficacy of the operation in selected cases, particularly in those cases in which the cardiovascular system is not yet especially injured. The value of the procedure in extreme cases, as of urinary suppression or of severe uremia in the course of chronic nephritis, is generally conceded. Lennender (9) (Upsala), Whitacre (10), Goodfellow and Eaton (11). The last two observers operated with spinal cocainization. Writers are not agreed as to the form of chronic nephritis most favorable to this procedure, and this question is made still harder to decide by the lack of uniformity among different pathologists and clinicians in designating the lesions encountered.

The following case is presented because the writer believes it has proven one particularly suitable to observations over a

[1] Case demonstrated before the San Francisco County Medical Society, May, 1904, and before the Cooper Science Club, May, 1905.

long period. Altogether the case has been studied twenty-three months, sixteen and one-half months after bilateral decapsulation had been performed. In the examination of urine only those methods were followed easily available to the practitioner. Albumin was determined by the Esbach tube, urea by the Doremus apparatus. While in the hospital a mixed sample of the twenty-four-hours output was used for analysis; after the patient left the hospital, the afternoon specimen freshly passed in the office was examined. The patient was given a graduated cylinder with which to measure the total twenty-four-hours output at his home. At stool, the patient used a separate urinal, so that no urine escaped unmeasured. Microscopic examinations were made only of centrifugalized specimens.

The patient, an intelligent Chinese-American, twenty years old, first presented himself for treatment at Lane Hospital, San Francisco, June 6, 1903. In his history there was nothing indicating the cause of his illness. Six weeks before, his face swelled, then his abdomen, feet, and legs. He had become constipated and the amount of urine had decreased.

Physical examination on the following day showed patient in bed, comfortable, no dyspnœa, face and eyes puffy, fair color, tongue heavily coated. Pulse 84, regular in force and rhythm, fair tension and volume. Artery wall felt. *Chest:* expansion fair, vocal fremitus absent in lower part of chest, on percussion skodaic resonance above fourth rib, below this the note is dull at the fourth rib in an erect position and at the sixth rib when he is reclining. Dulness reaches the fifth dorsal spine posteriorly. Breath sounds roughened above this line of dulness, distant and weak below it. *Heart:* point of maximum impulse within the mammary line, relative cardiac dulness begins at fourth rib, extends seven centimeters to the left and three centimeters to the right of the median line. Sounds clear, of normal relative intensity.

Abdomen much distended, movable dulness in midline, four centimeters below the navel.

Lymph glands not enlarged. Legs, scrotum, and penis very markedly edematous. Edematous cutaneous striæ marked on the right side of the thigh.

Urine.—Amount of 24 hours' urine, 420 cc., albumin 3 per cent. He was tapped and given dietetic (light diet) and medicinal treatment. Daily sweat baths preceded by pilocarpin grain ⅛ with enemata of iced water one pint every three hours were ordered. After one month his condition was practically unaltered. On June 25, urine output was 360 cc. Six weeks after admission he slowly began to improve. The largest daily output of urine was 1800 cc.

He remained in the ward two and one-half months, during which period he was tapped five times, 3600 cc. of slightly turbid fluid rich in albumin being obtained at one tapping. The left chest was aspirated once and one liter of serous fluid was removed. On leaving the ward, August 21, 1903, the patient felt strong, his face was peaked, he walked about with no consequent swelling of the ankles, his ascites was slight if any, his chest clear. Pulse 84, regular in force and rhythm, low tension. Diagnosis of case, chronic parenchymatous nephritis.

Although resting and taking dietic and medical treatment at home, he steadily grew worse, as did also the urinary conditions. In six weeks it was again necessary to send him to the hospital. He entered on October 5, 1903, in somewhat better condition than at his first admission, but he was still in a serious state. His second stay in the ward lasted two weeks. Upon his discharge he was slightly improved, although his ascites and anasarca were still evident and the urinary condition was practically unaltered. One month after this, November 19, 1903, he entered the hospital for the third time in four months with marked anasarca, ascites, and hydrothorax. His urinary condition was very bad.

December 16, 1903, patient's anasarca and ascites were about the same as at admission on November 19, 1903. Daily output of urine varies from 130 cc. to 920 cc. Condition of patient was serious, for he had not responded to dietetic or medical treatment, hot air baths, and the usual diuretics and cathartics. Surgical procedures were now deemed worthy of trial. He was transferred to the surgeons with the following summary concerning the case:

"Diagnosis of case, chronic parenchymatous nephritis, with ascites, hydrothorax, and anasarca. The cardiovascular apparatus is not appreciably affected."

Urine of this date, Dec. 16, 1903, showed the following conditions: Total quantity, 330 cc., acid, dark, cloudy; albumin, 1.4 per cent; urea, 8.8 gm. Large number of hyaline, granular, epithelium, leucocyte, and fatty casts. Epithelial cells detritus and mucous cylinders.

Patient was operated on by Dr. S. Stillman on December 17, 1903, under ether anæsthesia. Time of operation, one hour. The abdomen was tapped and both kidneys were decapsulated. The kidneys were of medium size and pale, the capsules were wrinkled and not adherent. Patient stood the operation well. On returning to the ward his pulse rate was 96, weak, but regular. The first day after the operation the patient was catheterized and also voided urine, total amount being 298 cc.

On the third day the total output of urine was 100 cc.

The patient continued in practically the same condition as before the operation, in spite of fluid diet with flaxseed tea and buttermilk. On December 30, thirteen days after the operation, because of abdominal discomfort, he was again tapped and 3650 cc. fluid were removed.

Upon January 7, 1904, diuretics, caffein, spartein, and strychnine sulphate were resumed with no increase in the output of urine.

January 10, the output of urine was 450 cc. and the patient's condition was distinctly unsatisfactory, anasarca and ascites being marked. Pulse 92, weak but regular. (No signs of cardiac embarrassment.) Patient complained of discomfort in abdomen; again tapped and 3830 cc. of fluid were removed.

On January 12, condition about the same, swelling of the eyelids marked, visual orifice distinctly impinged on, daily enemata of a quart of iced water were ordered, which probably helped the patient. On the first day of their application the output of urine increased from 390 cc. to 1080 cc., and upon the second day 1040 cc. He was again tapped on January 16, and 4000 cc. of fluid were removed.

After January 12, the output of urine in general increased, and after the last tapping (January 16) he improved gradually.

Upon January 29, 2050 cc. of urine were voided. On this date the enemata were discontinued and the urine continued to be voided in large amounts.

On February 1 he was able to walk about the ward. Pulse 68, weak but regular, low tension. The chest, especially on left side, still contained small amounts of fluid; ascites was still present in slight degree; dulness reaching three centimeters above pubes; slight edema of legs and genitalia.

February 10; there has been steady improvement, no ascites, no hydrothorax, no edema of face or thighs. There remains a slight pitting on pressure about the ankles. No subjective symptoms. Output of urine good.

Patient discharged on March 3. General condition good. Face not swollen, eyes normal in appearance. Tongue of good color, clean. Pulse 24¼, regular in force and rhythm, low tension, artery wall just felt.

Chest.—Lungs and pleuræ clear. Heart: point of maximum impulse well felt in fifth interspace within the mammary line.

Relative cardiac dulness extends eight centimeters to left and three and one-half to the right of the mid-sternal line. Sounds regular and clear, normal relative intensity. Abdomen negative, ankles pit very slightly on firm pressure, genitalia not swollen. Blood: hæmoglobin 90 per cent, red blood corpuscles 4,500,000. Patient is to continue light diet at home and is given directions as to the use of enemata for moving bowels.

April 1. Patient feels well and is now working in a newspaper office as translator. Physical examination shows considerable pitting at the ankles, which has increased gradually during preceding month.

There is no ascites or puffiness of the eyes.

May 9. Feels well, working several hours a day. Slight pitting at ankles. Otherwise negative.

May 21. Looks very well, works four to five hours a day, as representative of a commission house. Feels well. Ankles pit slightly. Lower abdomen somewhat dull, this dulness not movable, no distension of abdomen at all.

July 19. No discomfort except slight shortness of breath at climbing up stairs. Bowels move with enemata every other day. Pulse 96, good quality. Heart negative. Abdomen clear, no ascites, slight edema of ankles.

December 10. Physical signs identical to those of last examination, except that there is no edema of the ankles. No edema anywhere. Cardiovascular system normal. Blood: red blood corpuscles 4,600,000, white blood corpuscles 6800, hæmoglobin 90 per cent. Has been doing literary work during the past six months.

February 26, 1905. Patient has been seen several times during the past month; he feels well and examination is negative, except for operation scars and atrophic lines in the skin, resulting from previous edema; urinary conditions have improved.

April 26. Physical examination same as on February 26.

Concerning the Urinary Findings.

At the first admission, June 6, 1903, to August 21, 1903, the daily quantity varied from 360 cc. to 1800 cc.; the amount of albumin from 2.1 per cent to 0.35 per cent. A large number of hyaline, granular, epithelial and fatty casts, much detritus, and many epithelial cells were always present; towards the end of the period casts were fewer in number (especially the fatty ones) and the detritus was less in amount.

In the second admission, October 6 to 21, the daily quantity varied from 200 to 940 cc; albumin content 4. to 0.7 per cent. Microscopic findings identical with those of first admission.

On the third admission, November 19, 1903, the daily amount voided during the first two weeks averaged 920 cc. on soft and liquid diet, with one or two stools daily.

December 3 to December 10, daily average 660 cc.

December 10 to December 17, daily average 418 cc. with albumin 1.4 per cent and total area 7 grams. Microscopic findings as those of first admission.

On December 17, patient was operated on; in the nineteen hours following operation 235 cc. urine was secreted (voided and catheterized); dark, smoky, cloudy, specific gravity 1032, acid, albumin 1.7 per cent, urea 5.8 grams. Microscopically, hyaline, granular, epithelial and fatty casts in immense number; many red blood corpuscles and pus cells, soda urate crystals.

December 19 to 26, daily average 540 cc., specific gravity 1024, albumin still 1.4 per cent, urea 13 grams. Microscopic, hyaline, granular, and epithelial casts present in lessened number; considerable detritus.

December 26 to January 2, 1904, daily average 600 cc., character practically unchanged.

January 6 to 13, daily average 533 cc., character practically unchanged.

On January 8, fatty casts were seen for the last time.

January 13 to 20, daily average 973 cc. Albumin 0.5 to 0.8 per cent; urea 8 to 12 grams; fewer casts, and these mainly hyaline and granular. Iced enemata started on January 13.

January 25 to February 1, daily average 1774 cc. On January 28, specific gravity was 1010, albumin 0.5 per cent, urea 9.6 grams. No casts were found (no doubt due to alkaline reaction).

January 29, iced enemata discontinued.

February 1 to 8, daily average 1820 cc.

Examination of February 5: Amber, clear, neutral, specific gravity 1015, albumin 0.35 per cent, urea 9 grams; microscopic, few hyaline and finely granular casts and detritus.

February 24 to March 3, daily average 1945 cc. Examination of March 3: Amber, clear, acid, specific gravity ?, albumin 0.35 per cent, urea 23 grams; microscopic, few hyaline casts, some with fine granules adhering, mucus threads, a few flat epithelial cells and leucocytes, very little detritus.

On March 3, patient left hospital and has not returned. The following examinations were made on fresh specimens passed in the office. The quantitative estimations of albumin and urea are thus less trustworthy.

March 18 to April 1, daily average 1730 cc. Examination of March 19: Clear, amber, acid, specific gravity 1010, albumin 0.12 per cent, urea 17 grams; microscopic, few long hyaline casts, few granular casts, mucus cylinders and cylindroids, few flat epithelial cells.

April 24 to 31, daily average 1390 cc.

Examination of April 28 showed character practically unchanged.

May 8 to 15, daily average 1230 cc. Examination of May 9: Clear, light straw, acid, specific gravity 1015, albumin 0.15 per cent, urea 23 grams. Few hyaline casts, flat epithelial cells, and slight amount detritus.

June 1 to 8, daily average 1350 cc. Examination of June 15: Acid in reaction, uric acid crystals present, but no casts found. Otherwise practically identical with May 9.

Examination of September 17: Clear, amber, alkaline, specific gravity 1015, albumin 0.1 per cent, urea 13½ grams to liter; microscopic, few epithelial cells and leucocytes, but no casts.

December 10 to 17, daily average 1252 cc. Examination of December 10: Clear, light straw, neutral, specific gravity 1005; albumin too little to read on an Esbach tube, urea 15 grams to the liter. Microscopic, few epithelial cells and leucocytes, but no casts.

Examination of December 19: Clear, amber, specific gravity 1021, acid, albumin 0.05 per cent, urea 30 grams to liter; microscopic, few hyaline casts, mucus cylinders and flat epithelial cells.

February 17, 1905: Amber, clear, acid, specific gravity 1014, albumin not readable on an Esbach tube, urea 8.5 grams to liter. Very few hyaline casts and epithelial cells.

April 16 to 25, daily average 1135 cc. Examination of urine April 26: Clear, acid, specific gravity 1020. Centrifugalized specimen showed only a few epithelial cells, no casts. Albumin, trace present, not sufficient to read by the Esbach tube. Urea 16 grams to liter.

Conclusions.

A patient with grave chronic parenchymatous nephritis after being treated energetically by medical measures in the hospital for two and one-half months, was discharged much improved. This improvement was only of short duration. One and one-half months after being discharged patient's condition was again serious and it was necessary to re-admit him to the medical ward.

His second stay lasted only two weeks; at the end of that time his condition was very slightly improved. One month

after this he entered the hospital for the third time, in a serious condition. At the end of a month he had not improved. Bilateral renal decapsulation was then performed. Improvement was noted about three weeks after the operation. In contrast to that of previous admissions, the improvement following operation has been permanent, now lasting sixteen and one-half months and has been very positive.

This improvement is seen both in the patient himself and in his urine. The daily output of urine has increased, the urea has increased. Albumin is present only in traces, and casts are only exceptionally found. Renal decapsulation has been of value in the treatment of this case.

Since writing these notes it is learned that the patient has sailed for Canton, China, in order to take the governmental examinations for a scholarship in this country.

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DR. CHARLES FREDERICK WIESENTHAL'S MEDICAL REPORTS.[1]

BY EUGENE F. CORDELL, M. D.

The following reports of medical and surgical cases were found among the Wiesenthal papers belonging to the late Miss Wiesenthal, of Boston, and by her desire sent to her relations here after her death. They form only a part of the reports sent by Dr. Wiesenthal to his son Andrew, then a student of medicine in London. They are frequently referred to in the letters of the former. For instance, on the 5th of June, 1787, he writes: "I will send you of such Curiosities which occurrd in my practice if you could write something that your Name might be honourably mention by the Revewers. Sometimes a small triffle of that Kind has a great Effect." Again, on the 9th of October, 1787: "In one of the packets I sent you those cases which are somewhat remarkable but in one of them I mean that of Mr. Kervan I will only mention that the quantity of Matter issuing from that Tumor no bigger than a Wallnut was nearly 3 pints. Mr. Kervan was here about 2 hours ago." Again, five days later: "I have sent you various Cases in Physic & will consider of some more, and I think I will likewise send you some of my theoretical Opinions which you may be probably able to elaborate something farther and should it be worth the Notice of some of your friends it might be perhaps worth while to have it publishd for this is Truth that a great many more silly things have been publishd then what we should." And finally in an undated letter, probably about Dec. 1 of the same year: "It would be extremely well to have Something of yours appear in the Magazine. Medical Essay or Observations under your Name as nothing would elate you more. I have sent you several of my Occurrencies & will Send you Some more if perhaps something might be found amongst 'em worthy of attention & which might be plac'd in good Language a piece well wrote & approvd of by the critical Reviewer gives such a Name and Serves as Such an Introduction to a young Man as nothing can opstruct to him."

The originals are copied accurately, the quaint and odd style and spelling giving them, as I think, an additional flavor and interest. They show that their author was an accomplished, judicious, and conscientious physican, and a surgeon of the highest abilities. Unfortunately they were written upon very thin paper which is much worn in the foldings, so that words and indeed whole lines are here and there illegible. We may recall the fact that Dr. Wiesenthal was 29 years old when he came to Baltimore from Prussia. These reports form a good appendix to the "Sketch" of this worthy old physician, "The Father of the Medical Profession of Baltimore," published in the BULLETIN of July-August, 1900.

[CASE I.] ***An Extravasation of Blood to a great extent under the dura mater without interrupting the animal nor Vital functions by its pressure on the brain.***

A Servt. Woman of Jacob Mayers much addicted to Liquor was for some days supposd to be in Liquor, and I myself when I was calld to see her found her Actions correspond therewith, that forcd Smile or grin which intoxicated people generally have with incoherent Speech as if not in her Senses, and otherwise made me think that she had probably a bottle hid, but being watchd and in 3 or 4 days making only her Water involuntary she expird. we had reason to Suppose Something to be the Matter with her head and having receivd Six months before a blow on the head; her Master [consenting for the Calvarium] to be removd, we found all the Vessels big & small of the dura mater stro

[1] Read before the Johns Hopkins Hospital Historical Club, November 9, 1903.

ing with blood. and of a brown or black or dusky. I cut through it and to my Surprise discoverd a very compact hardish body, which by extracting it became distended and moore loose, not unlike a Spunge which from imbibing Moisture encreases in Bulk, and this being grumous blood destitute of all Serum, which no doubt for the Time it had lodgd there was separated therefrom and enterd the Circulation, and as this blood in its extended form was exceeding the bulk of 2 fists doubld and weight nearly seven or I think nine oz. and therewith at least 5 or 6 days the Animal and Vital functions were sustaind a phenomenon allmost incredible and J freely declare that it would by me have been Scrupled if J had heard Such a Case related as to its Veracity but as it is Fact I must submit it to the reader.

[Case II.]

Jim was an Irish Lad about years old a sturdy young fellow of a [good] Size, who had an Intermittent of which he was curd but complaind of a great palpitation of the heart which he had been troubld with for Some time previous to the Intermittent, this Palpitation encreasd to that degree that it was Seen and strongly felt | nay it could often be perceivd by the Ear | a Sort of a Sound | and he was never easy except when he pressd the Side of his breast against a Chair, his pulse was very irregular generally Small pulsations but now and then very strong Strokes, we apprehended an Aneurism in the Aorta, the Symptoms encreasd daily and his Legs became oedematous. we waited daily for the Catastrophe of the Aneurisms bursting but he died without it, the people being willing to inspect it. I opend him and found the Viscera all in good Order (*except the the ac glands much enlargd and indurated.*) but when the Thorax was examind the heart was of a most uncommon bulk, and nearly as big as a Small Bullock's heart. The Left Ventricle was amazingly long and to this Maisure

THE LENGTH OF THE VENTRICLE

and the Diameter was

THE DIAMETER OF THE LEFT VE

and a very strong polypose Concretion about three inches within the heart very fibrous and fleshy and so as it proceeded in the Aorta of a grey bluish Colour but very tenacious attachd by very thin fibres so the Ventricle Spreading itself broad.

[Case III.] *The Case of a large piece of the os femoris being taken out entire which having been Detachd both above and below from a new Bone and pushd out.*

You perfectly remember our old Negro Harry when in the year Sixty three he belongd to Mr Saml. Young and having an Obstinate ulcer above the Knee was given me under my Care and for better dressing into our house. J perceivd 2 or 3 small ulcers and found the os femoris carious. J put him under an Alterativ Course, and directed his Diet. the fellow being willing to get well was disposd to subject him self to that Regularity so uncommon in Negros,—After about 3 months proceeding in the Method J discoverd a Splinter to be felt which proceeded gradually to come out to a full Sight and by slow degrees in about 3 months

and appeard to be a large portion of the Bone, and quite immoveable. it was quite in the way but from its immobility I presumd justly that a large portion was behind to the extracting of which J deemd this to become a good handle, still having the Idea of a large Splinter. and to facilitate its being more easily taken out J laid the whole Lenght to about 5 Inches lenghtway open, but although the Opening large and kept so the Bone was yet immoveable. it proceded to appear Sideways not unlike a Boar's Tusk. and though every Day more and more it was tied and firm till after a whole twelve Month it became moveable more and more but could not be extracted by a moderate force, the wound was dilated still more and finding the probe to proceed easily largely up along Side of the Bone so that a pair of strong Forceps put up making a good and firm handle for that part which stuck out we extracted of the whole and solid os femoris near Six inches long, my Surprize was great and J was struck with a Notion that although a Small Callus was formd the Thigh would inevitably break, but notwithstanding my Caution to the fellow, he from his feeling being so strong walk on and continued So. the Wound heald up and I bought him afterwards as a Curiosity but although such Similar things have been recorded, what is to me deserving Notice in this Case is that he kept always walking and working on from first to last without even one Single Days laying by. The Bone was intire with the round pipe for the Marrow, and it is clear that the new Bone issuing from the Sound part gradually pushed the faulty out of its place much like new ones pushing the old ones forwards and this way more and more the whole was filld up, to which no doubt my not urging it too intensely but giving it Time for its formation did greatly contribute to.

[Case IV.] *The Case of the Brachial Artery being totally tore.* [Also marked on back of sheet—Case of Aneurism.]

I was calld to a frenchman, by a french Surgeon who had for the Space of a Week dressd and treated a wound in the bent of the Arm, from the bursting of a Gun which being shatterd all to pieces had wounded the Arm in 2 places across Seemingly altogether but very Superficial, and though nearly as he thought heald. the Arm below became daily more insensible and cold. on examining J found the parts without any Inflammation, and totally without all pulsation in the Wrist. on the Inside of the Arm below the bend, was a large bag likewise without inflammation and pain manifestly containing by its fluctuation a fluid, and above the Arm about the biceps a hardness. an aneurism was to be apprehended. and I prepar'd the apparatus for the Operation. and thought it expedient first to open the bag below within the Arm. which I did intentionally to have room for farther Examination very large, but what was my Surprize when—immediately fresh Arterial blood gushd out. but not by pulsatory Saltations but as if it was pourd out of a Vessel; the Tourniquet which happend previous to have been applid was immediately Screw'd. and after emptying the back of a great portion of grumous blood in Clods and along with it large pieces of the Artery in torn pieces still So considerable that it could be known and examind to be certainly the artery especially by its transverse coat; by introducing my fingers, I could reach up as far as the biceps where I pulld out a large Splinter of the Gun of the Lenght at least of 4 Jnches, and as the Jnteguments were all Separated from the Muscles J could with my fingers reach on the opposite Side of the Arm Sideway of the triceps, and there pulld out a much longer Splint of wood, and it was Amazing that in that Situation for a whole week past the 2 small wounds through which these 2 Separate Splints had passd nearly heald up. and no Jnflamation appeard all the while, but in Order to proceed in the Operation the Tourniquet was slakend not a drop of blood issued. I now desisted from doing anything respecting the Aneurism but on considering all the Circumstances. the Extent of the Wound within, the Lenght of Time. the coldness of the lower part. of the Arm—the want of pulsation, had reason to Suppose that nothing but an Amputation would Save his Life. and prepard the mind of the Patient accordingly for it. but to convince the poor Man that we were not prone to deprive him unnecessary of his Arm. J engaged my honour that J would deferr the Operation to the farthest Minute to See if anything should discover itself. the Wound being So extensive was well cleansd from everything foreign that was containd in it. and from the pieces of

the Arterial Coat I could judge that the Artery was destroyd at least to the full Extent of 4 or 5 Jnches, it was certain that the grumous blood and Splint for the Time stopt the farther effusion of blood from the Artery but when the large Jncision was made the clotted blood took by its coming away the pressure agt. the Artery off So that the blood freely issued along with the grumous blood, but it is difficult to be accounted for, that afterwards on slackening the Tourniquet or even after not a drop of blood should flow or appear. but should I offer my Sentiments on this Phenomenon J should think that although the impelling force was at first Sufficiently strong to protrude a quantity of blood, but that allready for Some day past Nature had attempted to form a new passage through a branch above the torn Artery as it often happens; and as the remaining Artery had for Some distance lost its contractility the impelling force could not continue to be So forcible as at the first onset, but became moreover inclind for forcing a New passage & thereby lessend the impulse still more. We were very Attentive and in 16 hours after the first dressing. a faint pulsation was obseryd by one of my young Students who was placd there on the Watch, this happy presage. So enlivend the drooping Spirits of the poor patient. and gave now all the Expectation So triffling Small the pulsation was at first it became more and more conspicuous. and in short the Limb was saved. The Wound now heald without impediment, but remaind smaller for Some time the Insensibility was removed in Some Degree. he was able to go to Sea in quality of a Steward. and recoverd during 6 Months part of the Stiffness of the Limb as well as feeling Since which I never heard of him.

1786 [CASE V.]

Monday the 20th of March my Son Andrew complaind of being unwell with a head Ake and a fever the Weather being moist and he exposd to it led us to Suppose that he had taken a Cold. and he had a pediluvium applied in expectation of being better in the Morning. but the fever continuing and rather encreasd and a Nausea he was apprehensive of having contracted the Contagion of a Malignant fever which then was very much prevailing in the poor house and being on Acct of the unfavourable Circumstances of being so crowded and badly provided the more assiduous of afording them Relief he slept but indifferent being pesterd with disagreeable dreams during the Night.

Tuesday. he was not at all refreshd the headache continued but the fever had remarkably diminishd and although he had a Nausea. he objected to an Emetic but chose in preference to take a purge, which operated well but aforded no other Relief his fever returnd, and slept the next night but uncomfortable the saline Draughts were taken. but in the morning.

Wednesday. his fever seemd to intermit So that he took 3 doses of Bark, the fever intermitting nevertheless did not aford much Relief he was heavy. felt disagreable and especially the head ake remaind very troublesome but in the Afternoon the fever returnd with a strong pulse a Dejection of Spirits. which was ascribd to his Impatience on Seeing the fever return when from the Intermission in the forenoon he had flatterd himself of being nearly well or that his Complaint was only a vernal Intermittent nay So mild were the Symptoms that nothing dangerous was apprehended, the Nausea continued and head ake likewise the heavy dreams so that

Thursday in the morning he took 3ij of the Vin. Antimon but from a childish Reason could not prevail on him self to drink the least warm Liquid in order to dilute the Bile which was thrown up in a large quantity the Throat was vellicated there from. he continued Sick at his stomach and felt himself more uneasy head ake continuing a greater debility and a Slight Delirium, the apprehension of contagion from the poor house Seemd to be revivd The Delirium encreasing and although the Symptoms were otherwise as yet very mild. there was rather Reason to apprehend Since in proportion to their Mildness he ought to be able to walk about and he appearing rather in other Respect worse, that at once they would appear in their real force. his fever was now constant the pulse weak the Surface of the whole Body dry a stupor head ake and allmost perpetual Sleep. but this Night he had an

Friday universal Sweat he had taken in small dose of the Vinum Ane. and as he had yet then Nausea. he took another dose to provoke a Vomiting but in no better Mode nor with better Success. the Symtoms seemed to remain at a stand still.

Saturday when we were again flatterd the perspiration keeping on and we did ascribe it to the Antime. wine the only trouble Some Symptom was a perpetual burning at the Stomach that whatever he receivd burnt him, it was my Opinion that as he never disengagd the Bile from the Stomach the Same being very acrid gave to the Stomach that uneasy burning Sensation. he now took the Saline draughts. but the fever now continued. he became more delirious. and manifest Signs of Malignity appeard. Doct Brown was so kind to visite us on

Sunday and thought the Saline Medicine the most proper but as Soon as possible to pour down as much Bark as possible with Wine. it was however difficult to give him either the Wine especially he detested. The Debility was most amazingly great. Delirium continued. his Anxiety was great, and the appearances in general very unfavorable. the pulse very small and at 120 in a Minute. a perpetual Watchfullness with a Stupor. or very interrupted Slumber it was with difficulty he could be prevaild upon to take any Wine although So strongly indicated. the State of insensibility made his fate very precarious—and continued to

Monday in the Same Manner. with clammy Sweats and Blisters were applied without Reserve.

Tuesday a Subsultus Tendinum was perceptible. the Musk was exhibited. and at Times a little Wine mostly by Deception was got down. Doct. Brown now despaird on his Recovery. we thought that probably a little Opium with Camphor would allay the Subsultus & which actually had a visible effect—and more blisters were applied. on

Wednesday he Seemd a little more refreshd and freer from the Delirium the Watchfullness which hitherto had followd the Drowsiness whic he had in the beginning now wore off and he Slept by intervals. the Subsultus lessend and on

Thursday he fell into a profound Sleep. and a profuse Sweat. he now rejected all Medicine and with great persuasion we could get him to take the Bark. th blisters became Mattery and on the whole we had a glimmering of hopes. the Alvus was kept open by glysters but during the State of Insensibility and delirium the Stools were involuntary.

Friday he still perspird constantly on but the Urine had no Sediment the Sound Keeping Suspended and the Colour of a high Orange yellow.

Saturday he was visited by Doct Troop who likewise wishd to have him drink plenty of Wine which we from Time to Time urgd him to but he now became morose and less tractable still now and then delirious, the Doct pronounced him past recovery, without the Wine. but whether it was to give a Refutation to the Doctors Prognostic he seem the following Night better slept more Serene an on

Sunday was so as to give us certain expectation of Recovery. his pulse becam fuller Softer and fell to 90. he took a little Broth and Sago with Some Appetite and drank of Water impregnated with fixt air. with which he continued to recover gradually to our great Satisfaction. [Dr. Osler is of the opinion that this case was one of typhus fever.]

The above is endorsed on the back "Case of Doctor A. Wiesenthal."

A LETTER TO THE GRADUATES OF THE JOHNS HOPKINS MEDICAL SCHOOL.

CHRIST CHURCH, OXFORD, October 30, 1905.

My dear students:—Last evening I was told that a box had arrived from America, and in a few minutes there was brought in a handsome quarto volume with an inscription on the back—"Collected Papers of the Graduates of the Johns Hopkins Medical School." Naturally, I was delighted, and in a few minutes was deep in the contents of the volume, filled with gratitude that you had so kindly remembered me. When, a few moments later, the man came in and asked if he should bring the others, I looked more carefully at the back and found that I was reading only one of a series of twelve superbly bound quarto volumes, furnished with a good index, and each one with a table of contents.

Many pleasant incidents have happened in the course of more than thirty years' teaching, but I do not remember ever to have been so completely overwhelmed, so to speak, by the character of the gift. Of course I was well aware that, in the few years that had elapsed since its foundation, much good work had been done by the members of the school. No small part, indeed, of your education consisted in helping you to reach the state in which you could become contributors to science, and for this your careful preliminary training, and your course in the medical school had fitted you. But that in so short a period of eight years you should have been able to accomplish so much, is a matter not less of astonishment than of pride. Among the 465 separate contributions an extraordinary range of subjects is considered—anatomy, physiology, pathology, bacteriology, hygiene, general medicine, surgery, pharmacology, clinical chemistry, gynecology, obstetrics, and medical literature. It is encouraging to see that the practical aspects of medicine and surgery have engaged your attention quite as much as the scientific.

The establishment of the Johns Hopkins Medical School was in the nature of a large experiment in medical education. To insure success three conditions had to be fulfilled:—(1) The students had to possess a thorough training in the sciences upon which medicine is based, in addition to a general education befitting men who were to be members of a learned profession. (2) Well-equipped laboratories had to be organized, in which the sciences of anatomy, physiology, pathology, pharmacology, and physiological chemistry would be taught by men who were investigators as well as teachers; and (3) lastly, a hospital to be to the senior students what the laboratories of anatomy, physiology, etc., were to the juniors, a place in which the phenomena of disease, with all their human interests, should be studied under skilled supervision.

These splendid volumes are a striking testimony to the success of an undertaking, which we all feel has already passed the experimental stage.

Two things remain—on your part, to keep up the high standard you have set with the steady energy of men who have faith in the future of scientific medicine and faith in their own powers to help in its progress. By your enthusiasm and unselfish devotion to the best interests of the profession you should stimulate the production of good work elsewhere. What you have done in Baltimore may be done by other students—many of them your own—and by other teachers. The record you have made is unique in the history of medicine in America, but it should not be so for long. In equipment, in methods, and in results, foundations equal to those made by Johns Hopkins are possible in places animated with the spirit of scientific research.

On the part of the trustees and the faculties of the two great institutions, linked together by the Johns Hopkins Medical School, there is the bounden duty to maintain an incessant watchfulness lest complacency beget indifference, or lest local interests should be permitted to narrow the influence of a trust which exists for the good of the whole country.

Though absent in the body, my thoughts are constantly with the school to which I owe so much, and in the progress of which I take so much pride. I hope to be able to return every session for a brief period, and in this way keep in touch with the work of the hospital and of the medical school.

Believe me, my dear students, to be,

Yours faithfully,

WM. OSLER.

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PROCEEDINGS OF SOCIETIES.

THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

October 23, 1905.

Dr. MacCallum in the chair.

Pulsating Empyema. DR. R. I. COLE.

Case 1 was admitted to the surgical wards in April complaining of trouble with his lungs. He had an attack of pneumonia in December, which lasted for five or six weeks and left him weak and failing in strength. Ten days before admission he had marked exacerbations of pain and weakness and continued to grow weaker. His chest was aspirated and a small amount of purulent fluid removed. The entire left side of the chest was bulging, and there was dullness in the left supraclavicular fossa and flatness through the entire left chest below. There was an impulse in the third and fourth interspaces to the right of the sternum. The whole front and axilla of the left chest showed a visible pulsation, forcible, diffuse, and systolic in time. The chest was opened from behind and a large amount of pus removed. The patient left the hospital in good condition.

Case 2 was admitted in January complaining of shortness of breath. He had signs of a pleural effusion on the left side. The chest was aspirated and at different times eleven, twelve, and thirteen hundred cc. of fluid were removed. Tubercle bacilli were demonstrated in the fluid. The patient improved and left the hospital practically well in March. He returned in June with shortness of breath and an irregular fever. A needle was inserted into the left chest and a small amount of bloody fluid was removed, which contained many mononuclear and but few polymorphonuclear cells. About October 1 there was a bulging in the left axilla, and upon October 17 a definite area of pulsation in the third and fourth interspaces outside the mammillary line shown by tracings to be systolic in time. Cardiac dullness reached 8 cm. to the right of the mid-sternal line. There was tympany in Traube's space, the dullness reaching only to the fifth rib. It was thought at first to be an encapsulated tuberculous pleurisy, but aspiration showed a purulent fluid in which polymorphonuclear cells formed ninety-four per cent of the total cells. A rib was removed from the back and the cavity was drained. The patient is now in good condition. Sailer, after an examination of the literature, found ninety-five cases of pulsating empyema reported. Among the earliest reports are the three cases reported in 1840 by MacDonnell, of Montreal, and the cases by Stokes, of Dublin. Twelve of the ninety-five cases were serous effusions. The probable explanation of the pulsation is that ordinarily the elasticity of the lung takes up the pulsation, but if the lung be held firmly by adhesions or is completely compressed, the pulsating waves are entirely spent upon the chest wall. To pulsate, the fluid must always be under high pressure.

Cystic Kidney. DR. R. I. COLE.

Male; 41 years; complains of pain, shortness of breath, and weakness in back. He did not know date of onset. Fifteen years ago after rowing he noticed an enlargement of his abdomen, but it gave him no discomfort. Eight years ago a physician told him he had albumin in his urine. Two years ago his color changed; he became cyanosed, and there was pigmentation over his forehead and cheeks. On admission to the hospital he showed some cyanosis, a moderate grade of arteriosclerosis, and signs of cardiac weakness, but no heart murmurs. His abdomen was distended with distinct bulging in the flanks. As soon as the ascites had decreased a large mass was made out in the left flank, deep in the abdomen. It can be lifted forward from behind and has an irregular surface with prominences, one of which resembles a ball three or four cm. in diameter. On the right side in a similar position is a like tumor reaching down into the pelvis. It is far back in the abdomen and can be lifted forward. It also has irregularities. The patient shows symptoms of cystic kidneys. He has signs of cardiac weakness; urine of low specific gravity; some albumin and casts. While in the hospital the swelling of his legs and ascites disappeared and his shortness of breath improved. Up to this time he had never had blood in his urine, but a few days after his discharge from the hospital he returned with a specimen of bloody urine which he had passed. The patient also shows a pigmentation over forehead and cheeks in addition to the cyanosis which is constantly present. His hæmaturia may be due to rupture of small vessels between the cyst walls. The symptoms which give reason for the diagnosis of cystic kidneys are, large bilateral tumors, cardiac weakness, chronic nephritis, and hæmaturia. Three of Dr. Osler's four cases were recognized during life.

Congenital Cystic Kidney. DR. C. H. BUNTING.

The term cystic kidney denotes the same as the large polycystic kidney of the French. The first cystic kidney reported was at the Royal Society in Paris before 1725. The first congenital cystic kidney was reported before 1790. The last summary made in 1900 gives two hundred cases in adults, ninety of which were congenital, and thirteen were in infants. Cystic kidney occurs in about the same proportion in each sex, and may be found at all ages from the premature, or still-born, infant to old age. There is a remarkable family tendency. Virchow reports cases in which four of six children were affected. Singer reports a family in which the first, fourth, seventh, tenth, and thirteenth children had bilateral cystic kidneys, the other children being normal. The condition also appears in the second generation. But a single case of crossed inheritance is reported, the inheritance in all the others being from father to son or from mother to daughter. The kidneys of the new-born may be very large, cases being reported in which the pair weighed over a thou-

sand grams. In the adult they have been found weighing over five thousand grams.

Dr. Bunting passed about sections from gross specimens from the liver and kidneys obtained at autopsy of two children of the same mother. In the cortex of these were fine cysts. In the liver the portal surfaces had the appearance of an oak leaf. Through the medulla there was marked dilatation of the ducts, some of them divided up into finger-like processes. There were also mitotic figures present. In the liver there was increase in the size and number of the bile ducts. Cystic liver occurs in 20 per cent of the cases of cystic kidney. In the adult these cysts are lined with flattened epithelium and have a fluid content but no connection with the bile ducts. The theories of formation of cystic kidneys are grouped under four heads—the obstruction theory, new-growth theory, a theory of malformation in the development, and a theory which places them between malformation and new growth, and is a combination of the two. Virchow believed at first in the obstruction theory. In 1875 an advocate of the new-growth theory claimed that there were outgrowths from the tubules which were solid or tubular and underwent a colloid degeneration, and analogous to adenocystomata of the ovaries. The malformation theory dates from Kussner, who thought the condition to be due to a failure of the collecting tubules to open into the pelvis. The advocates of the fourth theory believed that the condition arose from the failure of the undifferentiated epithelium to grow in equilibrium. The lesions are ones of epithelial hyperplasia, which would not be included among new growths; they are adenocystomata. The ducts in the pancreas and liver show the same hyperplastic condition. These cases can show malformation in other parts. Polydactylism, hydrocephalus, harelip, atresia of anus or vagina, rectovesical fistulæ, heart lesions, patent Ductus Botalli, and many associated defects in the genito-urinary organs have been found in these cases. The lesion is more nearly related to congenital malformation than to new growth, and we must look in the parents for the cause. Only ten per cent of cases are unilateral. Cystic kidneys may be found in all ages from infants to adults of eighty years. As a rule if there is enough cortex for the person to live for awhile after birth he may live a normal lifetime unless cut off by chronic nephritis. In adults with cystic kidneys there are the same associated malformations and liver conditions. It is very difficult in the adult kidney to make out anything in regard to the pathogenesis or histogenesis on account of the great changes that have taken place.

Infectious Arthritis. Dr. R. Fayerweather.

A report was made of bacteriological work carried out by him in the laboratory of the Tufts College Medical School, Boston. Of nine cases of various clinical types, four yielded positive bacteriological results. In the positive cases two clinical types are represented—one being a case of typical articular rheumatism; the others clinically infectious in character, being of the variety designated by Schüller *polyarthritis chronica villosa*. Operation was performed in two of the latter cases, and cultures taken from the joint-fluid and from the excised synovial villi. In the other cases the fluid was aspirated under rigid aseptic precautions. All inoculations were made on blood serum and pure cultures obtained in every instance. In the case of acute rheumatic fever the same organism was obtained from each knee-joint. In the operative cases the organisms cultivated were also demonstrated alone in stained sections of the excised villi. The clinical and pathological reproduction of the lesions was accomplished in rabbits by intra-articular injection of small doses of the cultures in bouillon suspensions. In one case the organisms were identified in the lesions, as in the human tissue. Large intravenous doses were without effect. The organisms found in these four cases could not be identified with any described in the various manuals. Three are bacilli of a spore-bearing variety, but with distinct differences in their cultural peculiarities; one is chromogenic. Of these, that isolated from the case of acute articular rheumatism is one. The fourth is a small diplobacillus, non-sporing, bearing only a slight resemblance to the pneumococcus. The clinical and pathological characteristics of polyarthritis chronica villosa were emphasized, and their distinction from acute articular rheumatism and the progressive form of arthritis deformans pointed out. The bacteriological work of others in this particular field was briefly referred to. The sum total of evidence is for a varied rather than a specific microbic etiology. Cultures were shown of the organisms here reported, also microscopic preparations showing their presence in the actual lesions.

THE JOHNS HOPKINS HOSPITAL HISTORICAL CLUB

October 16, 1905.

Dr. MacCallum in the chair.

John Howard's Observations on Hospitals (1773-1790). Dr. Hurd.

Two books have been added recently to the library of the Nurses' Training School of the Johns Hopkins Hospital, the first entitled the *"State of the Prisons in England and Wales with Preliminary Observations and an Account of Some Foreign Prisons and Hospitals,"* and the second, published in 1789, a few months before Howard's death, entitled *"An Account of the Principal Lazarettos in Europe with Various Papers Relative to the Plague; Together with Further Observations on Some Foreign Prisons and Hospitals and Additional Remarks on the Present State of Those in Great Britain and Ireland."* These, together with a copy of the *" Life of John Howard,"* by J. B. Brown, which had also been added to the same library, were shown. It is evident that Howard's interest in hospital reform was excited by the work which he had undertaken in connection with jails and prisons. He found prison infirmaries in shocking hygienic condition with a moral atmosphere which was most detrimental to all inmates. He consequently began to visit infirmaries, poorhouses, orphan asylums, lazarettos and hospitals, as well as prisons and jails wherever he went, and the volumes men-

tioned contain full and interesting details of these visits. He investigated thoroughly, setting down his conclusions without prejudice, but often with startling frankness, and accumulated a mass of facts which moved good men in every country to reform all penal and charitable institutions. It would be interesting to give many of the details contained in the two volumes, but I will content myself with a brief account, in his own words, of what he found in the London hospitals. He says:

"I shall beg leave to subjoin a few general observations concerning defects in the London hospitals, premising that I fear the public attention to them is much relaxed of late years in consequence of the newer establishment of dispensaries which have multiplied so as to injure the funds of the older institutions.

"The securities and fees required at admission into many of the hospitals bear hard upon the poor and absolutely exclude many of those who have the greatest occasion for charitable relief. The nurses' fees, in particular, open a door to many impositions.

"The visits of Governors are too often only a matter of form, the visitor hurrying out of an offensive room and readily acquiescing in the reports of nurses, etc. Hence I apprehend many instances of neglect in surgeons and their dressers as well as other officers go unnoticed.

"I have never found any clergyman administering consolation and admonition to the sick; and prayers are usually attended by very few.

"White-washing the wards is seldom or never practised, and injurious prejudices against washing floors and admitting fresh air are suffered to operate.

"Bathing, hot or cold, is scarcely ever used; I suppose because it would give trouble to the attendants. There are no convalescent or sitting rooms so that patients are often turned out very unfit for work or the common mode of living.

"The admission of great quantities of beer for patients from ale-houses by alleged or pretended orders from the faculty is a great and growing evil. Every proper article of diet should be provided by the hospital and no other on any account be admitted.

"It is a pity that for want of attention to these circumstances, such noble institutions should be rendered of much less public utility than was intended by their governors, founders, and supporters."

In some of the accompanying notes interesting side-lights are thrown upon usages which to us seem incredible. Thus, for example, he speaks of the urine of the patients in one hospital being sold as a perquisite of the nurses. In another hospital patients were found lying in loose straw upon the floor. In a third (this was in Ireland) the bath house had been converted into a pig-pen and sheltered the pigs belonging to the warden of the hospital. In still another, two patients were found lying in the bath-tub for the lack of any other bed.

As a result of his observations and investigations he presents the following summary of what he regards as the desiderata of a good hospital:

"The situation of an Infirmary or Hospital should be on elevated ground, near a stream of water, and out of a town. The wards, if only one for each sex, to be twenty-five to thirty feet high, arched and without apartments over them; otherwise, the building to consist of only two stories besides the cellars, and the area extended as far as necessary upon this plan, that the inconvenience of higher rooms may be avoided. The first floor raised four or five steps from the ground and the ascent made easy to the entrances. The wards fifteen feet high to the ceilings and distinct ones for medical and chirurgical patients. Two doors to each ward, one of them iron or latticed or canvas. Staircases of stone, spacious, convenient and easy as in Italy, Marseilles, Malta, etc. No room to contain more than eight beds. The windows lofty and opposite, or circular apertures (as at Leeds infirmary), opening into passages not less than six feet wide; hasps and staples to the upper sashes to prevent their being shut at improper times, or like those at Guy's hospital: a stone gallery for more readily opening and shutting the windows as in the Italian hospitals. The ceilings lathed and plastered and proper apertures in them. The fire-places in the middle of the longer side of the wards; the beds in spacious recesses as at Toledo or Burgos; or to each bed a recess with curtains as at Genoa, Savona, etc. The bedsteads iron, painted and with a screw that the backs may be easily raised, or lowered; the beds on varnished boards or laths, with hair mattresses. In each ward a cistern, basin and towel for the patients. Vaults on the outside of the wards and water-closets as at Guy's hospital; for every improvement that may render such places less offensive should be carefully adopted in all houses containing a number of inhabitants. Airy rooms and refectories for convalescent patients; one spare and unfurnished ward; each ward to be taken in succession and called the spare ward. The kitchen, washhouse, brew-house, and bake-house out of the house, but if the kitchen be in the house it should be lofty as in Christ's hospital (not underground), and the entrance through the servants' hall. A convenient bath with an easy descent into it. A piazza and spacious walk to induce patients to take the air and exercise. The wards washed once each week—scraped and lime-whited at least once a year. (The machines at Northwich for supplying the salt-mines with fresh air, being on a simple construction, would be of admirable use in hospitals, especially if situated in confined places.) The patients washed at their admission in the cold or warm bath and to conform strictly to the rules of nicety and cleanliness."

History of Typhoid Fever. DR. MCCRAE.

One of the important lessons in this is the difficulty which may attend the recognition of a disease. In early times typhus fever, the plague, malarial fevers, relapsing fever, and typhoid fever were more or less grouped together, but the greatest difficulty came in the separation of typhus from typhoid fever. It is not possible to recognize typhoid fever in the description in Hippocrates and Galen, although it is possible that the disease described as hemitertian was typhoid fever. Certain writers gave descriptions of a condition which suggests that they had seen typhoid fever and recognized some of its essential features. Spigelius, Sydenham, Hoffman, Struthers, and Gilchrist were among these, while Morgagni described a case in considerable detail. In the early part of the nineteenth century through more careful work in pathological anatomy it was recognized that in a certain group of cases with continued fever there were intestinal lesions. In 1829, Louis described a disease to which he gave the name of typhoid fever, but it is doubtful if he made a clear distinction between it and typhus fever. At this time the prevailing disease in France was typhoid, while elsewhere on the Continent and in England typhoid and typhus fevers existed together. The general opinion was that the group of these cases was associated with intestinal lesions. It is to Gerhard, of Philadelphia, that the

greatest credit for the clear distinction is due. He studied under Louis in Paris, and on his return to Philadelphia saw cases of typhoid fever, but we cannot be certain that he recognized clearly the distinction between it and typhus fever until the epidemic of the latter disease in 1836. He was then able to set forth clearly the distinction between the two diseases in his report in 1837. Stillé, Shattuck, James Jackson, Sr., and Hall were all early supporters of the duality of the diseases. In 1824 Nathan Smith wrote a treatise in which he gave a very clear description of the features of typhoid fever, although he may not have recognized its distinction from typhus fever. In 1842, Elisha Bartlett published the first book in which the two diseases were discussed separately. There were many who accepted the new views at once, among them being especially Jenner and Murchison in England and Griesinger in Germany.

After the recognition of the disease there were many conjectures as to its mode of origin. Murchison was the first to suggest that the excreta were the source of infection, but for a time special emphasis was laid on putrefaction. One of the first men who held clear ideas on the question of infection was Budd, who lived in Bristol. His articles in the Lancet from 1856 to 1860 are well worth reading. He believed that the danger was in the stools, that infection arose from a definite source, and could not arise *de novo*. The discovery of the causal bacillus in 1880 by Eberth and since then the large amount of work done on the various problems have widened our knowledge of the disease and the problems connected with it.

Discussion.—Dr. Welch pointed out that it was impossible to distinguish the two diseases until autopsies were carefully made. As a result of these we find a considerable number of descriptions of lesions which are undoubtedly of typhoid fever. He drew attention to the excellence of the description of typhoid fever given by Nathan Smith, one which had not been approached up to his time and hardly surpassed since. The French writers of the early nineteenth century, particularly Broussais, held that all fevers were symptomatic. No name holds so prominent a place in establishing the distinction between the two diseases as that of Gerhard. His conclusions were reached by seeing the diseases separately. In Dublin, Graves and Stokes held out so long because they saw the two diseases together.

Dr. W. G. MacCallum drew special attention to the accurate description given by Budd, and pointed out that he was one of the first to describe amœbic dysentery. He also emphasized the value of Hoffman's work on the pathological anatomy of typhoid fever.

NOTES ON NEW BOOKS.

Diseases of the Blood. By Prof. Dr. P. Ehrlich, Prof. K. Von Noorden, Dr. A. Lazarus and Dr. F. Pinkus. *Nothnagel's Encyclopedia of Practical Medicine.* American Edition. (*London and Philadelphia: W. B. Saunders & Co., 1905.*)

This authorized translation under the direct supervision and editorship of Alfred Stengel makes accessible to English readers the excellent work of the Ehrlich school of hæmatology on the blood and its diseases. While the original has been faithfully reproduced, the editor has improved on the original by interpolating the views of opponents on mooted questions in hæmatology. These insertions are most noticeable in the chapter on the histology of the blood, and in the section on pseudoleukæmia (Hodgkins disease), where full notice is given of the excellent work of the American investigators of this subject, Reed, Simmons, and Longcope. This chapter has been further enhanced by the reproduction of the plates from Longcope's monograph on the subject. The editor has further brought the book up to date by the addition of notes on the various subjects treated, from the literature subsequent to the appearance of the original German edition. Among such additions is a review of the subject of X-ray treatment of leukæmia.

The work as a whole is to be highly recommended to all interested in hæmatology.

Atonia Gastrica (*Abdominal Relaxation*). By Achilles Rose, M. D., and Robert Coleman Kemp, M. D. 12mo. pp. 204. (*New York and London: Funk & Wagnalls Company, 1905.*)

This monograph gives an exhaustive résumé of the nomenclature, history, diagnosis, and treatment of gastric atony. A third of the volume is devoted to the methods of outlining the stomach, accompanied by tables and diagrams. All the newer methods, including the use of the gastro-diaphane, the Röntgen ray, and the stomach whistle devised by one of the authors, are fully described.

A discussion of the treatment of gastric atony by the author's method of support with adhesive strapping and the application of such strapping to other types of abdominal ptosis, together with the report of cases, conclude the volume. T. R. B.

Manual of the Diseases of the Eye. For Students and General Practitioners. By Charles H. May, M. D., Ophthalmic Surgeon to the City Hospitals, Randall's Island, New York. Fourth edition, revised. With 360 original illustrations, including 21 plates, with 60 colored figures. (*New York: William Wood & Co., 1905.*)

This is the fourth edition of May's Manual of the Diseases of the Eye. The author has carefully gone over the text and corrected a few errors which were present in previous editions. The work has been enriched with a number of additional color plates, and we are glad to note the addition, also, of several new illustrations, especially those to the subject matter of lid operations. The general arrangement of the book is very good, and the essentials of ophthalmology are set forth in a clear, accurate, and sufficiently full manner as to admirably serve the needs of the medical student, for whose use the book is designed, in his course in ophthalmology. B. B. B., Jr.

Color-Vision and Color-Blindness. A Practical Manual for Railroad Surgeons. By J. Ellis Jennings, M. D., Professor of Diseases of the Eye, Medical Department, Barnes University, St. Louis. Second edition, thoroughly revised, with illustrations. (*Philadelphia: F. A. Davis Company, 1905.*)

This is the second edition of Jennings' book on Color-Blindness. The author does not aim at any originality in the book, but gives an excellent résumé of the history of color-blindness, the various well-known theories as to the development of color sensation, and the usual methods of determining the existence of partial and complete color-blindness. We are glad to note in this edition a good description of the Williams and Thomson lanterns, which are not used as frequently as they should be by ophthalmologists, even when requested to report on the presence or ab-

sence of color-blindness. We know of no work on this subject which is more compact and valuable from a practical standpoint, and we recommend its perusal to all those who are accustomed to examining the eyes of railroad employes and applicants for the army, navy, or other branches of the public service. B. B. B. Jr.

Biographic Clinics. Volume III. Essays concerning the influence of visual function, pathologic and physiologic, upon the health of patients. By GEORGE M. GOULD, M. D., Editor of American Medicine, etc. (*Philadelphia: P. Blakiston's Son & Co., 1905.*)

This attractive book is the third in Dr. Gould's series, and, like its predecessors, it preaches the gospel of the new ophthalmology and illustrates the precept by the examples of John Addington Symonds and Henri Taine, gleaned from their biographies and correspondence. The doctrine is also enforced by the republication of "Eyestrain as a Cause of Headache and Other Neuroses," by Simon Snell, of Sheffield, England, and "Slight Errors of Refraction and their Influence on the Nervous System," by C. Ernest Pronger, of Harrowgate, England. It contains, in addition, the interesting papers which the author has contributed to medical and scientific journals during the past two years on subjects allied to the main topic of the book. The chapter entitled "Optic and Ocular Factors in the Etiology of the Scoliosis of School Children" is most valuable and suggestive, and should be as thoroughly considered by orthopedic surgeons as by ophthalmologists. The same is true of the chapter, "Pathologic Results of Dextrocularity and Sinistrocularity," which in many cases seems to explain the etiology of scoliosis and head-tilting. A chapter on the "Reception of Medical Discoveries" also furnishes interesting and stimulating reading, although the reader doubtless will feel that its tone is too bitter and pessimistic. The author is so much in earnest he has little regard for conservatism and is impatient of criticism. The book as a whole is most suggestive and valuable.

Dispensing Made Easy. With numerous formulæ and practical hints to secure simplicity, rapidity, and economy. By WM. G. SUTHERLAND, M. D. Aberd. Second edition, revised. (*Bristol: John Wright & Co.; London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 1905.*)

This little manual is for English practitioners in England. All references are to the English authorities. The formulæ are good and the practical directions are clear and judicious. An American adaptation with references to the U. S. Pharmacopœia would render it equally useful on this side of the Atlantic.

Medical and Surgical Reports of the Bellevue and Allied Hospitals in the City of New York. Volume I, 1904. Edited by ALEXANDER LAMBERT, M. D., W. K. DRAPER, M. D., and GEORGE WOOLSEY, M. D.

This is a pleasing volume typographically, with clear type, broad margins, and good paper. The full and complete account given of the system of taking and preserving histories will prove of much advantage to other hospitals. One cannot avoid an expression of surprise, however, that *entries* in copying ink in the case record are contemplated. Those who have had an experience with the stickiness of copying ink and the ease with which the page becomes blurred and disfigured, can but deprecate its use. Paper histories for dispensary patients also seem too fragile for ordinary use. These are minor criticisms, however. The index of diseases and complications seems admirably planned and the effect of this excellent system must be to render all case histories very accessible.

The papers which follow are of varying excellence. Lambert's "Some Statistics and Studies from the Alcoholic Wards of Bellevue Hospital," Gilman Thompson's "Report of Fourteen Cases of Pernicious Anemia," and Luckett's "Rational Treatment of Tetanus" are excellent scientific papers. Others like "Prevention of Shock During Surgical Operations," "Observations on Some of the Molecular Changes Caused by Light," seem rather popular than scientific. There are some typographical errors, as Halstead for *Halsted*, anthropathies for *arthropathies*.

International Clinics. Vol. II. Fifteenth Series. 1905. (*Philadelphia and London: J. B. Lippincott Company, 1905.*)

The present volume is fully equal to the previous volumes of this publication. The articles, as might be anticipated from the manner of collection, are of unequal excellence. D. Barty King's "Observations on the Treatment of Pulmonary Hemorrhage by Adrenalin Chlorid" is a careful and systematic account of the reasons why adrenalin chlorid is contra-indicated in the treatment of hæmoptysis. The same is true of Edes' "Suggestions Regarding the Treatment of Neurasthenia," which is equally a careful statement of the result of long experience and much observation. Willson's "Diagnosis of Incipient Pulmonary Tuberculosis" is a timely paper, full of accurate observation of eighty-six cases of incipient or advanced tuberculosis. His conclusion that "a positive diagnosis of tuberculosis should often be made long before fever is present and long before tubercle bacilli have been found," commends itself to all who have given attention to the subject. Others, like Hemmeter's "Physiologic Aspects of Ehrlich's Side-chain Theory and its Application to the Physiology of digestion," seem more theoretical than practical.

Taken as a whole, however, the volume is full of interest and deserves a careful reading on the part of those who are engaged in the practice of medicine.

Natural Science in Hygiene, or The Life-History of the Non-Bacterial Parasites Affecting Man. For the use of students of Public Health. By JAMES RODGER WALTON, M. A., B. Sc., M. D., Diplomate in Public Health, University of Cambridge. (*Bristol: John Wright & Co.; London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 1905.*)

This is a very elementary manual of the life-history of the parasites of the vegetable kingdom, such as fission fungi, yeast fungi, and mould fungi; also of protozoa, vermes, insecta, and arachnida, parasites of the animal kingdom. The author confines himself to those parasites which affect man and of necessity the view which is given is wholly practical. It is a convenient book and serves a good purpose by collecting together many otherwise isolated facts. It should lead the reader to investigate these animal and vegetable parasites more fully and to read more ambitious works.

The Medical Epitome Series. Practice of Medicine. A manual for students and practitioners. By HUGHES DAYTON, M. D. Series edited by VICTOR COX PEDERSEN, A. M., M. D. (*New York and Philadelphia: Lea, Brothers & Co., 1905.*)

This is an admirable little manual. Its descriptions of disease are clear and concise. The material is systematically arranged and the treatment of disease suggested is modern.

Chirurgie du système nerveux (Crâne et encéphale. Rachis et moelle. Nerfs). GEORGES MARION, professeur agrégé à la Faculté de médecine de. (*Paris: G. Steinheil, éditeur.*)

The appearance of this volume is most timely, dealing as it does with a subject that is attracting rapidly increasing attention. The work is extensive and one is struck with the value of the numerous illustrations, which are clear and true.

The first of the three parts, dealing with the skull and its contents, opens with an excellent chapter on the topographical anatomy and the methods of localizing the situations of the various intracranial structures and regions, which is followed by a carefully prepared chapter on the technique of cranial operations. Then follow a number of chapters in which are considered the indications for and the treatment in affections of the skull and brain, including, among others, injuries, intracranial hæmorrhage, traumatic epilepsy, and new growths. The chapter dealing with the localization of and extraction of foreign bodies from within the cranium is of particular interest.

Part two is devoted to the surgical diseases of the vertebræ and spinal cord, a thorough presentation of the topographical anatomy being followed by a consideration of the operative procedures. Lastly are considered various affections—trauma, infections, new growths—demanding surgical treatment.

Part three is devoted to the surgery of nerves. Conditions, such as compression, rupture, and tumors, which demand surgical measures are first considered; then follow discussions of the operations for section, resection, elongation, suture, etc. The surgery of the sympathetic system is more briefly considered, though the section contains much of interest.

The descriptions of the operations throughout are clear and concise, and important features are brought out in an excellent manner both by the text and illustrations. There can be little doubt that this work contains the most complete presentation of the surgery of the nervous system that we have.

Psychiatry. A Text-book for Students and Physicians. By Stewart Paton, M. D. (*Philadelphia and London: J. B. Lippincott Company, 1905.*)

This work represents not only a new and timely text-book of psychiatry, but what is more important, offers a readable presentation of modern scientific conceptions regarding abnormal functioning of the brain. In a certain sense it may be regarded as a pioneer work in English. Three striking characters, and at the same time merits, may at once be indicated:

(1) The author throws out many of the dogmatic time-honored definitions of psychic anomalies which cumber treatises on mental disease, and which have been largely the outgrowth of incomplete observation and analysis of cases.

(2) He attempts to indicate some of the more conspicuous needs and means of approach in the scientific study and treatment of cases of alienation.

(3) He brings together in condensed form a mass of observations and opinions of current authors, particularly German, dealing with all phases of the subject.

Until comparatively recently the majority of English and American writers, following the example of Krafft-Ebing, have been content with psychiatry as a descriptive science and have offered simple symptomatic narratives of disease conditions. In 1885 a prominent American alienist, discussing the classification of insanity, said:

"It assumes three fundamental forms—*mania*, manifested by delusions of excitement, expansive ideas, exaggerations, self-consequence, incoherence, etc.; *melancholia*, manifested by delusions of depressing character, painful ideas, and apprehensions; *dementia*, representing conditions of mental failure and feebleness of mental action. All cases of insanity come under these three heads. Cases may be acute, sub-acute, chronic, periodic, paroxysmal, but they are either mania, melancholia, or dementia."

This ancient scheme with slight modification or amplification has also been found sufficient by many alienists and directors of insane hospitals even up to the present day.

Paton's book offers a grateful contrast to the older methods and doctrines, it points out that the actual number of demonstrated facts is relatively small in comparison with the mass of speculative hypotheses which have been accepted, from time to time, in lieu of facts, and emphasizes particularly the importance of the method which does not adopt uncritically inherited teachings but rather seeks to prove the ground inch by inch.

To the student who is looking for cut-and-dried statements this book will not appeal. On many questions the various possibilities are discussed, and opinions of different observers are set forth, but the conclusion is left undrawn. This from the didactic viewpoint would often seem unfortunate, but it is withal the safer part and more to be commended than the drawing of conclusions from insufficient evidence—a fault into which psychiatric writers are only too liable to fall.

Paton takes legitimate exception both to the methods of modern education which assemble a heterogeneous mass of humanity and subject all indiscriminately to an educational routine to which all are by no means equally adapted; likewise to the fanatic zeal of sociologic faddists in their efforts to "elevate the masses," and thus wrench them out of the conditions to which they were born, and in which they are calculated, by their mental and physical makeup to lead their lives. In the consideration of both these questions he sees important indications in the hitherto little-heeded subject—the prophylaxis of insanity. Speaking of the fallacies of so-called education Paton observes (page 9):

"Every one admits that it is the duty of the physician to warn those with weak hearts or lungs not to overtax those organs. Is it not equally important that the mental welfare of a community be safeguarded? Only some men are born to be educated; how many more, unfortunately, have thrust upon them an education which is disastrous not only to themselves, but also to the community at large. To prevent the sins of overeducated fathers and mothers from being visited upon the children unto the third and fourth generation is a problem of great sociological as well as economic importance to the state."

Further (page 198), "If the aid of intelligent physicians were sought in determining the question as to what children were fitted to receive a public school education, unquestionably many cases of insanity which develop later in life would never occur. It is a curious comment upon popular government that so little effort is being made along these lines, and that, while the public has the right to prevent the spread of measles or scarlet fever, it assumes no authority in matters relating to the prevention of alienation. . . . To render it possible for an individual who is physically and mentally unfitted for the stress associated with the effort to undertake the acquirement of what is termed a liberal education should be regarded as an offense against the public health and morality no less culpable than if one were to deliberately place him in an environment where he is exposed to an infectious disease."

The one urgent need of the immediate future in American psychiatry is an institution, hitherto quite unknown on this side, but whose advantages Europe has long enjoyed, namely, the University Psychiatric Clinic. To the qualifications of the modern clinic a separate chapter is devoted (pages 167 to 177). As the best example of the up-to-date insane hospital may be mentioned the new institution at Munich, completed last year, which is a type of the best fruits of modern intelligence in the construction and arrangement of clinics for the insane, for the most advantageous study and treatment of patients, and the purposes of clinical instruction. This institution has recently been the subject of an elaborate monograph by the director, Prof. Kraepelin (Barth, 1905, 2M), and was also briefly described by Paton in Science for September 8, 1905.

Considering the enormous strides which have been made in all departments of mental medicine, particularly within very recent years, Paton's book of 600 pages may be considered a condensed

one; indeed the objection may possibly be raised that sometimes the discussions are too brief, that in his endeavor to give credit to a wide range of opinions without becoming bulky, the author assumes a degree of familiarity with the subject on the reader's part and often forces him to some wholesome mental exercise in the way of reading between the lines.

The first part of the book, comprising 230 pages, is devoted to general considerations, including the more essential known facts in etiology, symptomatology, and treatment; the remainder of the book is given to the clinical description of disease-groups. In his scheme of classification Paton follows the "clinical" method, and he deals with the subject under the following heads:

(1) *Mental anomalies the result of defective development of the central nervous system.*

(2) *Psychoses which are probably in part the result of autointoxication.*

(3) *Psychoses the result of chronic intoxications.*

(4) *Psychoses associated with imperfect functioning of the thyroid gland.*

(5) *The manic-depressive group.*

(6) *The dementia præcox group.*

(7) *The dementia paralytica group.*

(8) *The epilepsy group.*

(9) *The hysteria group.*

(10) *Neurasthenic and psychasthenic states.*

(11) *Psychoses associated with organic disease of the central nervous system.*

(12) *The paranoia group.*

(13) *The senile group. Psychoses connected with the period of senile involution.*

Pleasantly conspicuous by their absence are the "symptomatic sub-groups" which exist in dozens in many text-books, and which are no more than names of isolated symptoms, if not indeed of mere surface appearances, which are thus assumed to represent disease varieties.

The treatment in general is a conservative one, the maniaco-depressive and dementia præcox groups are designated as provisional differentiations, which have been made, however, on principles "which are consistent with and not antagonistic to progress." The old epochal psychoses have been eliminated and in their places are discussed the predilection of certain pathologic mental conditions for certain periods of life, as well as the influence of the age of the patient in modifying the clinical manifestations in any given disease form.

The criticism may be made that the work is not pre-eminently adapted to the needs of the student who is totally unfamiliar with the subject and who is anxious for categoric statements and final facts. To the student, however, who is trained from the beginning to methods of research, and who esteems the process of personal investigation and careful analysis, of weighing opinions, and of tentative conclusion, above the acquiring of information by way of didactic dogmatism, an exposition of mental diseases such as the one under consideration will prove a wholesome guide.

CLARENCE B. FARRAR.

A Text-book of Physiology, Normal and Pathological. For Students and Practitioners of Medicine. By WINFIELD S. HALL, PH. D. (Leipzig), M. D. (Leipzig), Professor of Physiology, Northwestern University Medical School, Chicago. Second edition, revised and enlarged. Illustrated with 340 engravings and three colored plates. (*Philadelphia and New York: Lea Brothers & Co., 1905.*)

In this comprehensive work the author has endeavored to present as concisely as possible, not only physiology properly so-called, but such parts of allied subjects as might be considered useful in throwing light upon the central theme. Consequently one finds scattered throughout the book chapters or paragraphs relating to chemistry and physics, embryology and anatomy, pharmacology and pathology, clinical microscopy and clinical medicine; nor does the historical aspect of the subject fail to receive a passing word.

In order to present this vast amount of material within the compass of 800 pages (containing many illustrations), the author has been obliged to employ the greatest possible brevity. This fact not only renders the book very unattractive reading—in which respect it differs but little from the majority of text-books—but often places the sense a little beyond the grasp of the student who is approaching the subject for the first time. Moreover a condensation which necessitates the allotment of but six lines to the Young-Helmholtz theory of color-vision, one-half page to color-blindness, three-quarters of a page to the splanchnic nervous system, three pages to the vasomotors and so forth, is not likely to give the beginner a very clear conception of the subjects in question.

If the work be regarded as a compend, that is, an aid to the student in reviewing before examination, then its size and the diversity of the material which it contains may somewhat impair its usefulness, while viewed as a dictionary of the medical sciences, it may be a little incomplete and lacks the convenience of an alphabetical arrangement.

The author is a teacher of some experience and the publication of this second edition is doubtless the response to a demand, and there is every reason to believe that where this demand exists the work will meet with the approval of teachers of physiology, especially as it is apparently up to date and contains much valuable information.

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